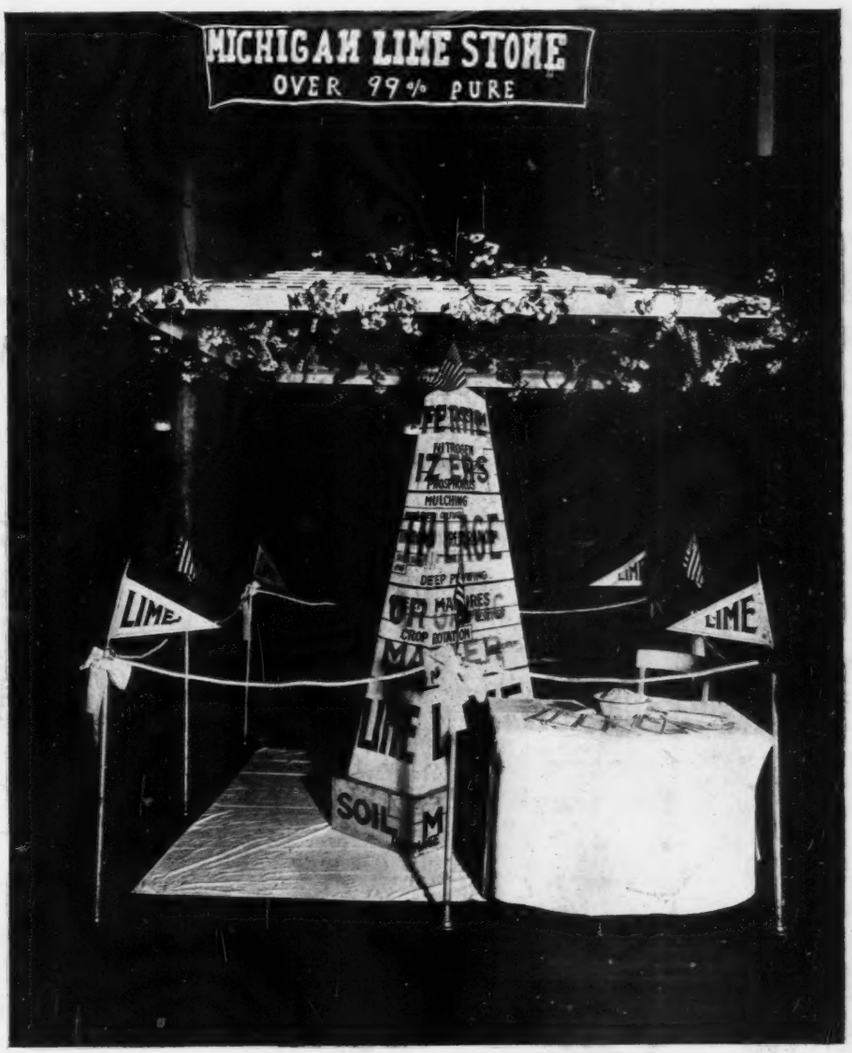
Rock Products

$2.00 A YEAR | CHICAGO | MAY 8, 1918

Spreading The Lime Gospel



NO EMBLEM has been more widely used in promoting the sale of agricultural lime than that illustrated herewith. This soil fertility pyramid was devised at the Agricultural Experiment Station of Cornell University to show graphically the essential elements of a fertile soil. It demonstrates at a glance that lime is the fundamental element in a fertile soil.

This device is extensively used in the advertising literature of lime and limestone manufacturers. The accompanying illustration shows its adaptation to a New York State Fair exhibit.

Rock Products

TRADEPRESS PUBLISHING CORPORATION
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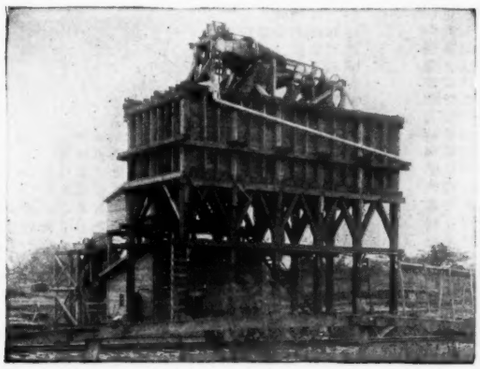
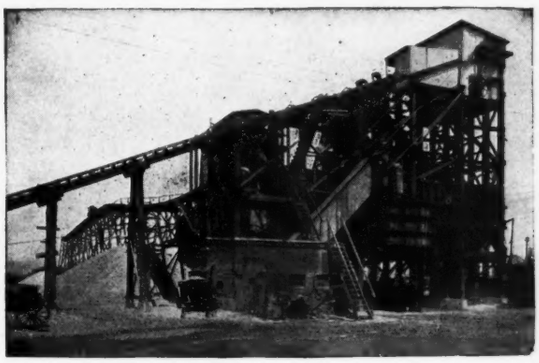
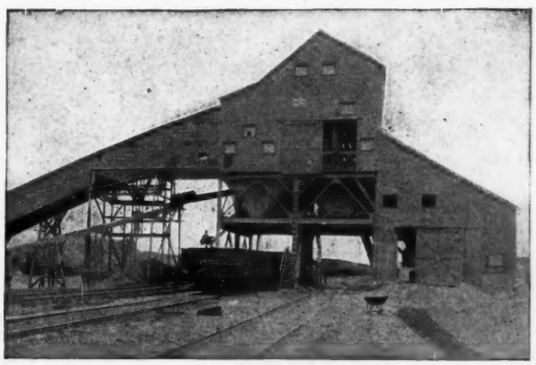
Table *of* Contents

ALPHABETICAL LIST OF ADVERTISERS







WEBSTER PLANTS

THE worst enemy that the plant owner knows is the enforced shut down for the repair or replacement of a broken part. This is especially true where the raw material is rock, sand, or gravel.

The best insurance against shut downs is machinery designed to meet hard use —machinery built heavy and hard enough for the service in which it will run. Higher in first cost perhaps, but **dependable, strong, long-lived.** That's a description that fits—

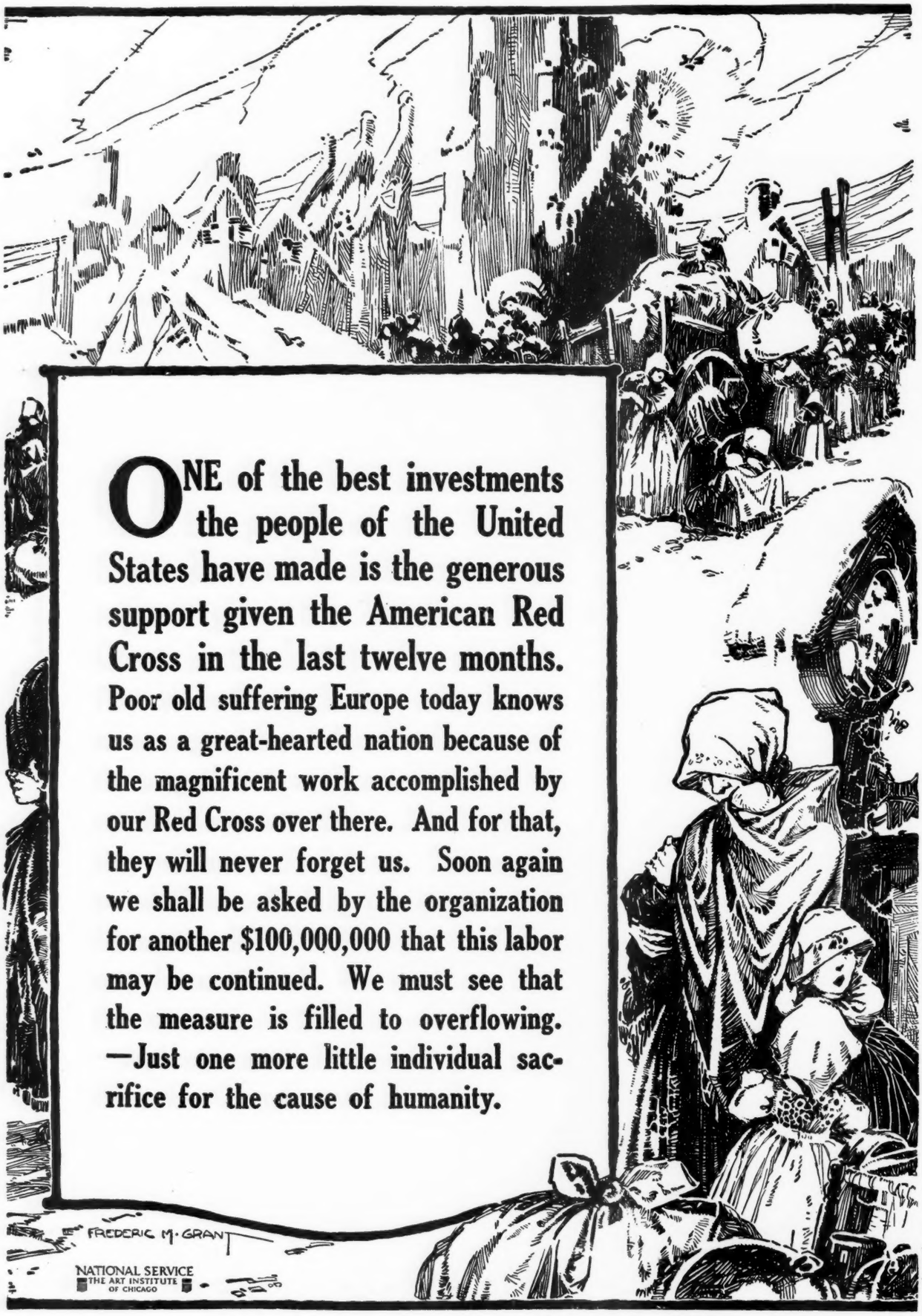
WEBSTER ELEVATORS CONVEYORS and SCREENS

For more than forty years we have been Engineers and Manufacturers of elevating and conveying machinery. Our long experience is at your service. Estimates and suggestions on request.

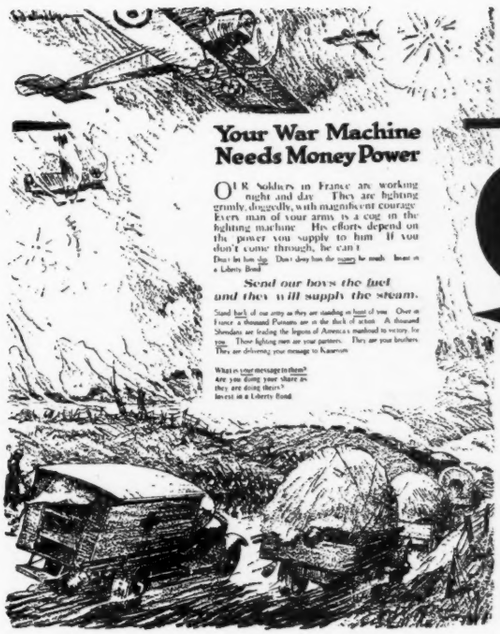
The Webster M'f'g Company
Tiffin, Ohio

Chicago **New York**

(225)



This space donated to the winning of the war by ROCK PRODUCTS.



Sterling

Heavy Duty Motor Trucks

Applies Also to Rock Products

By Floyd W. Parsons, Editor of The Coal Age, in the Saturday Evening Post, April 6, 1918.

Cheap Deliveries by Motor

Fuel conservation is interesting, but we cannot do much in the way of saving unless we first get the coal into our bins. During the past winter most every city has been taught a lesson showing the need of emergency storage yards. Hundreds of communities will take steps to insure against local fuel famines next winter. New York City, with its millions of people, narrowly averted disaster from freezing, while at the same moment nearly 400,000 tons of coal were lying across the Hudson River in New Jersey terminals waiting to be moved. There was hardly a city that did not present its spectacle of icy streets with horse-drawn coal wagons stalled on every block. This is an age of motor vehicles and not a time to employ horses to haul coal through snowdrifts. If we do not provide against a repetition of last winter's coal-delivery experiences we shall be deserving of all the hardships we shall have to endure.

It is worth noting in this connection that one of the largest Government departments in Washington decided to investigate the problem of local coal delivery. Trucks were purchased and a coal yard was rented. The lowest bid price for delivery of the required coal tonnage was $1.46 per ton. The department's complete figures from August 16, 1917, to February 1, this year, show a delivery cost of approximately $.74 per ton. The total saving on 7216 tons delivered was $5174. It is likely all Government departments in Washington will follow suit. Coal delivery may not be such a problem after all.

Read These Heavy Hauling Economy Facts

HIGH authority and proved experience at the Nation's capital will interest you.

—Only 74 cents per ton for coal delivery costs.

—Consider Sterling Heavy Duty Motor Trucks for your work on long or short hauls.

The Sterling exclusive wood-in-laid frame eliminates vibration.

We cushion Sterling frames with wood. Bolts, not rivets, are firmly anchored in this shock-absorbing cushion. The result is—absorbed vibration which assures longer life, less maintenance and inspection expense, practically no "loose bolt" troubles.

STERLING DUMP TRUCKS are designed and constructed especially for any trade.

Better engineering, better materials and better workmanship have evolved a haulage unit giving strength without weight and capacity without burden.

SIMPLY, SCIENTIFICALLY BUILT—Simply constructed—several hundred parts usually found in motor truck construction have been omitted altogether in Sterling engineering. Built to resist the terrific road shocks and so easy to handle that it is safe in the hands of the ordinary driver.

2½, 3½, 5 and 7 TON CAPACITIES—Worm drive with the exception of the 7 ton size. For the farsighted business man seeking future hauling profits rather than initial cheapness, this better engineered, better constructed dump truck will answer all hauling requirements. **Write for complete information.**

Sterling TRUCKS

Sterling Motor Truck Co.

Builders of Motor Trucks Exclusively for Eleven Years

MILWAUKEE, WIS., U. S. A.

Distributors in leading cities

You will get entire satisfaction if you mention ROCK PRODUCTS.

The Seal of Dependable Performance

ACME THE TRUCK OF PROVED UNITS

Trade Mark Reg. U. S. Pat. Off.

In-Built Strength That Assures Good Service Always

The heavy duty demands of the varying branches of the rock industry are efficiently met by the mighty Acme truck. The Acme has the inbuilt strength—put there by men who know the rock industry needs.

The reliable Acme truck is constructed to a liberal factor of safety. By this we mean that vital parts are over-sized to provide a reserve power and strength that absolutely insures *dependable performance* under the most severe conditions of daily service.

This reserve strength to resist maximum strains is enabling Acme trucks to carry their full rated capacity day in and day out at a minimum hauling cost that is absolutely fixed.

ACME Proved Units Are Combined Perfections

This powerful, time-proved truck, will save you money, time and man-power. Acme service is certified to you in advance, by Acme proved units.

HELP WIN THE WAR
Relieve the Railroads
Reduce your delivery costs and end delay with the ACME in your service

Acme Proved Units are combined perfections—the master products of sixteen master manufacturers. These are Acme proved units. Study the names. Each stands for supremacy.

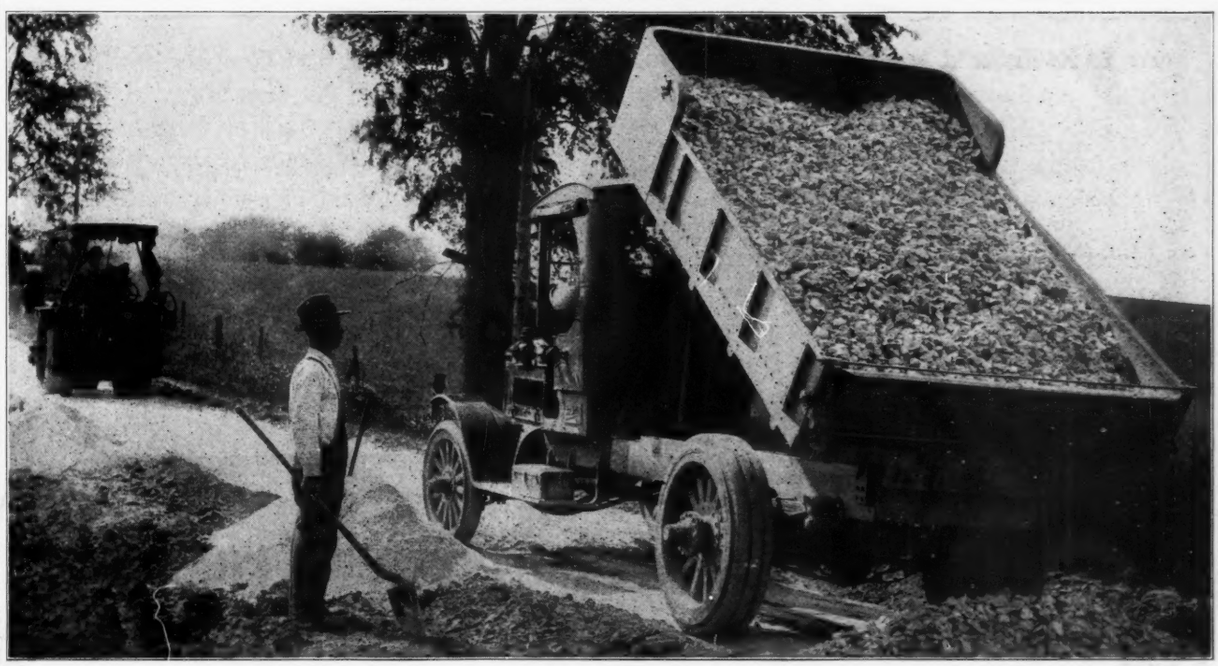
Write for New Acme Book

This valuable book is crowded with facts and figures of interest to every man in whose business haulage is a problem. It's titled "Pointers to Profits"—a valuable guide book to delivery profits. Write on your letterhead for a copy.

ACME MOTOR TRUCK COMPANY
156 Mitchell Street, Cadillac, Michigan
One-ton to Four-ton Models. Each oversized in both capacity and dimensions

Proved Units of ACME Construction

Continental Motor
Timken Axles
Timken Bearings
Timken-David Brown Worm Drive
Cotta Transmission
Borg & Beck Clutch
Ross Steering Gear
Blood Bros. Universal Joints
Smith Pressed Steel Frame
Detroit Springs
Hayes Artillery Type Wheels
Eisemann High Tension Magneto
Rayfield Carburetor
Stewart Vacuum Feed
Tubular Type Truck Radiator
Centrifugal Type Governor



Rock Products

Vol. XXI Chicago, May 8, 1918 No. 1

Why Neglect Highway Improvement?

British Experience Proof of Necessity of Wartime Work

THERE is no bureau of the United States Government at Washington which has offered or apparently intends to offer constructive suggestions for handling the war-time highway improvement problem. The War Department has recognized the military significance of a few roads in the vicinity of army cantonments, the Post Office Department has come to an understanding of the value of hard surfaced roads to its parcels post service, the Secretary of Commerce has gone on record in favor of a road improvement policy, as has also the Director-General of Railways, but the Department of Agriculture, which should have the most active interest, which does now have the only real authority to act, has thus far followed only a negative policy. In fact the U. S. Office of Public Roads is being used only to put the brakes on local highway authorities, who wish to go ahead with their road-improvement programs, and who in many instances actually have the cash in hand—cash which the law says can be used for no other purpose.

Public roads are the fibre, the threads which hold the map of the country together. They are the cohesive power which binds the infinitesimal number of private parcels of land into a town, a county, a state, a nation. The railways are bands of reinforcing steel, but they would be as useless without the public roads as are the reinforcing bars in concrete without the cement which surrounds them. We have existed, we could exist, after a fashion, without the railways, but no people ever has or ever can exist as a nation without this elemental means of communicating with one's neighbors.

After nearly four years of war the British now fully appreciate the cost of neglecting their road improvement work. The following is from the London "Times" of March 8th:

"The war has emphasized the importance of the roads and transport. In war the importance of all kinds of transport comes home to all. Motor vehicles are taken off the roads, the use of petrol is re-

stricted, railway traveling becomes expensive, the postal services are slower and fewer, steamships and ferries no longer operate with smooth regularity, motor omnibuses and tramway systems feel the pinch, and at last transport of all kinds becomes a matter in which the people and government are forced to take an active interest.

"In England the money earmarked for the upkeep of the roads has been taken for other purposes during the war. Big sums are still being spent on their upkeep but because of the wear to which they are being subjected and the shortage of labor, raw material for repair, and money, they are deteriorating very quickly, and it is now recognized that millions of pounds must be spent in order that the roads may be in passably good condition after the war in the interests of commerce and industry. The British government and the Board of Trade have recently appointed a Road Transport Board to consider the working of British roads in war time."

Why should we not profit by British experience?

Ohio Macadam Association Tackles Big Business Problems

Meets in Columbus to Discuss and Act on Reducing Hazards and Rates in Workmen's Compensation and Fire Insurance

CRUSHED STONE MEN everywhere should sit up and take notice of what the quarrymen of Ohio are about. Primarily they are co-operating with the State Industrial Commission to carry out the spirit of the Ohio workmen's compensation and employers' liability law. Secondarily they are placing themselves in a position to save many thousands of dollars annually by reducing both their workmen's compensation insurance and their fire insurance rates. They are the first organized body of Ohio employers to co-operate actively with the State Industrial Commission in a systematic campaign to reduce accidents.

Stirred to Action by Rising Rate

The present law of Ohio prohibits an employer from carrying employers' liability and workmen's compensation insurance in stock companies. Such insurance is provided by the State Industrial Commission or by the employer, if he prefers, under bond. The State Industrial Commission is now carrying the insurance of all the quarries, whose annual premiums have mounted to a total of nearly $150,000. The rates paid vary from $3.85 to $4.77 per $100 of payroll, being dependent on a merit rating scale.

The steadily rising base rate of this insurance since January 1, 1916, when it was $2.30 to the present $3.85 rate has caused considerable uneasiness and dissatisfaction among Ohio crushed stone producers, which culminated in a meeting at Columbus, April 25, to discuss the possibility and practicability of these employers carrying their own insurance, and to take up the problem frankly with the State Industrial Commission.

Coöperation with State

A half day's session was spent, around a table, in a discussion of the problem with E. E. Watson, actuary of the State Industrial Commission. Mr. Watson explained many details of accident and casualty insurance which were unfamiliar to the members present, and he showed the utmost willingness to coöperate in every way.

The discussion developed the fact that with but two or three notable exceptions—the France Stone Co. and the Ohio Marble Co.—none of these quarries have been worked systematically along the line of accident prevention. D. C. Souders of the France Stone Co., Toledo, has given the subject practically his whole attention for some time, with the result that this company, operating thirty odd plants, has been able to obtain and retain the minimum basic rate of insurance, and even then have a large surplus to its credit.

Investigating Committee Appointed

On the Thursday following this discussion, May 2, the executive committee of the Association met again in Columbus and had another half day's session with the actuary of the State Industrial Commission, Mr. Watson, at which more perplexities were cleared up. The result of this meeting was the appointment of a committee of three, two from the Ohio Macadam Association and one from the actuarial department of the State Industrial Commission, which will soon make a field survey of the quarries of Ohio to investigate and report on the following points: Whether the present classification of employers under limestone quarry operator is fair to the men who are operating large permanent plants as against the small "fly-by-night" operators; how accidents in quarries and crushing plants may be prevented and the insurance rate reduced; to list and classify all the operations of a quarry and thus determine their relative hazard.

Means Labor Conservation

The results of this investigation will be of far-reaching importance to the quarrymen of Ohio and indeed of the whole country, as it is the first of its kind to be undertaken in the United States. It may not unlikely result in the establishment of a certain standard of operating practices which will entitle the members of the Association that adopts them and enforces them, to a special classification under the insurance law. It is almost certain to result in the saving of many dollars to the Ohio quarrymen, not to mention the conservation of life and limb so important now to a continuance of the world's industries.

Allied to the same work is the reduction of fire insurance risks and rates by observance and enforcement of certain rules and regulations, the installation of some fire-fighting equipment, etc. On this subject the Association had the benefit of a conference and discussion with T. Alfred Fleming, the State Fire Marshall of Ohio and of Mr. Souder of the France Stone Co. This matter will also be gone into in detail by a committee at a later date.

Handling Explosives

Mr. Souder said statistics show that 90 per cent of all fires are accidental and preventable. Less than 10 per cent are intentional, namely arson cases. The fire loss of the United States for a period of five years averaged $250,000,000 annually, or almost $690,000 a day. The fire losses of the United States and Canada in 1916 were over $231,000,000. The per capita fire waste in the United States is $2.51 per annum; in Europe during normal times 33 cents per capita per annum. The Ohio crushed stone industry went on record in favor of doing its bit to conserve the nation's wealth.

The matter of handling and storing explosives during these war times is another matter of extraordinary interest and importance to quarrymen. They are both morally and legally responsible for all explosives in their care; and the proper guarding of these stores to prevent theft by German spies and pro-German traitors is matter to cause some uneasiness to many quarry operators. On these points many valuable suggestions were made by the United States Inspector of Combustibles, resident at Columbus, who was guest at the meeting.

Motor trucks hauling bank sand and gravel in Wisconsin

Motor Trucks for Sand and Gravel

There Is a Place for Both Large and Small Size Trucks for City Deliveries

By J. Crow Taylor

WE HAVE already passed the time for discussion of the question of whether or not motor trucks for the delivery of sand and gravel are economical or desirable in comparison with teams, will render better service or will prove more efficient. The economy of the truck is already an established fact and the question for discussion, with fruitful results, comes on points of comparison in the matter of sizes and how to handle trucks to obtain the most satisfactory service under different conditions.

To one who has long observed and studied the progress of motor trucks in various lines of service the first outstanding fact to impress itself is that sand and gravel trucking is a service in which the heavier trucks belong, and will continue to dominate, especially in the larger cities.

Perhaps here as in the coal trade every size and style of truck will find some place for itself, but apparently the light truck will have a more limited place in the sand and gravel handling than it has in the coal trade, even though seemingly they both belong to what might be classed as heavy hauling.

Coal Trade Not a Criterion

Generally the cubic yard is still the unit of measurement in the sale and delivery of sand and gravel, while the ton is the unit of measurement in the sale and delivery of coal. These are in a way comparable, as is also the method of handling at both ends of the line, but a peculiar difference develops in the actual carrying out of the business. It has been found in many instances that those using lighter trucks (trucks of one and two tons) have gotten more satisfaction out of them especially in the domestic trade than those using heavier trucks ranging from three to seven tons, except in larger cities where there is enough big trade service to justify the heavier truck. This is largely because of peculiarities of coal delivery to individual customers which is different from the delivery of sand and gravel.

Two-Yard Capacity a Minimum

Among distributors in the smaller cities and towns where there are many small job lots to deliver there will undoubtedly enter the use of smaller trucks even down to the converted Ford, which will carry a single yard at a time. In the larger city trade, however, one might as well accept as the minimum or smallest size truck one that will carry two yards, which would mean a range in carrying capacity of 2½

to 3 tons. Generally, too, those who have experimented with two and three ton trucks with beds that will hold from 2 to 2½ and 3 yards have, when the time for buying new trucks come, sought the larger ones, those ranging from 5 to 7 tons.

Much naturally depends upon local conditions and the possible percentage of trade in sand and gravel that will be in single yard orders. There is some of this small business even among the larger handlers of sand and gravel, but even this can be handled with the two yard truck, and a dividing board, as coal is handled in a two-ton truck with a dividing board. Moreover, there is generally some similarity of beds, both in design and size, between those used for coal and those used for sand and gravel, and quite commonly the same truck is put to both services. Truck and teaming concerns which haul by contract equip their trucks with a sort of standard bed that can be used alternately for coal and sand.

Only End-Dumping Type Feasible

There is this difference noticeable, however—the sand bed practically always demands end dumping, and one might say low dumping, whereas in the coal trade there are some high dumps and a number of types of side dumps which are provided to meet the needs of delivery requirements peculiar to the coal trade.

No reason or argument has been found for varying the sand truck in its dumping arrangement. There are many dumping devices, and some trucks, especially where it is intended to haul brick, so arranged as to drop the lower end and make a low dump. Some have hand dumping rigs and some one kind of power dump and some another, but practically everywhere the load is dumped through the back end, and nowhere has there been encountered any disposition to depart from this.

Idle Trucks

One of the noticeable curiosities in the trade in the use of trucks is a marked disposition to fret more over the idleness of large trucks than of the smaller ones. When a man buys a heavy truck he seems to become immediately and earnestly concerned with the idea that he must provide tonnage and keep it busy, otherwise it will not yield a fair return on the investment. This same man will not fret so much over keeping a half dozen wagons idle or two or three small trucks standing still, because, while in the aggregate they may represent as much investment as in the big truck, he only sees one of them in his mind at a time, consequently it does not loom up so conspicuously.

The logical conclusion that should be taken home is that no more loss results in having one four-ton truck stand idle an hour than in having two two-ton trucks alternately stand idle an hour.

Life Is in Proportion to Service

Moreover, there is another point in logic that too many overlook, and that is the fact that when a truck is standing idle it is not wearing out. The writer encountered a graphic reminder of this in the rounds in the case of a man who had a truck that was only being used intermittently. He had used this truck six years and said he would not part with it at its original cost price at the end of the period. Then he went on to say that when the truck was standing idle it was not wearing out nor getting old in the same sense that a team of horses would be getting old, neither was it eating hay and corn; consequently there was nothing to fret about.

Most of the users of heavy trucks figure for safety in depreciation and make their calculations for three years of usefulness for a heavy truck kept busily employed hauling sand, gravel and coal. Trucks may last longer than this, but that is considered a safe figure. Now, logically, if a truck is only used half time it may be figured to last from five to six years instead of only three, so there is some saving grace to this idleness, which seems to be the nightmare of many a truck user.

Small Trucks Handy

Where a man has a big enough business in sand and gravel—and coal, too, if he makes coal a feature—to justify quite a number of trucks it will be found handy and worth while to keep for hurry jobs and small orders a small truck, even one as small as a single yard capacity, because the smaller truck is quicker and lighter to handle and will make more trips and yield better returns in filling small orders and rush orders than the heavier and more cumbersome one. On the big jobs in the larger cities and for general hauling where there is any large tonnage of sand and gravel to be moved, however, the best range of sizes for sand and gravel trucks as indicated by experience is from three to five tons.

For use in the smaller cities and towns to serve many orders for the smaller building operations one and two-ton trucks will be found useful, and will perhaps in the final analysis yield more satisfactory results than the larger ones which have the right of way in the heavier volume of trade in the big cities.

Sand Concern Producing from Former State Lake

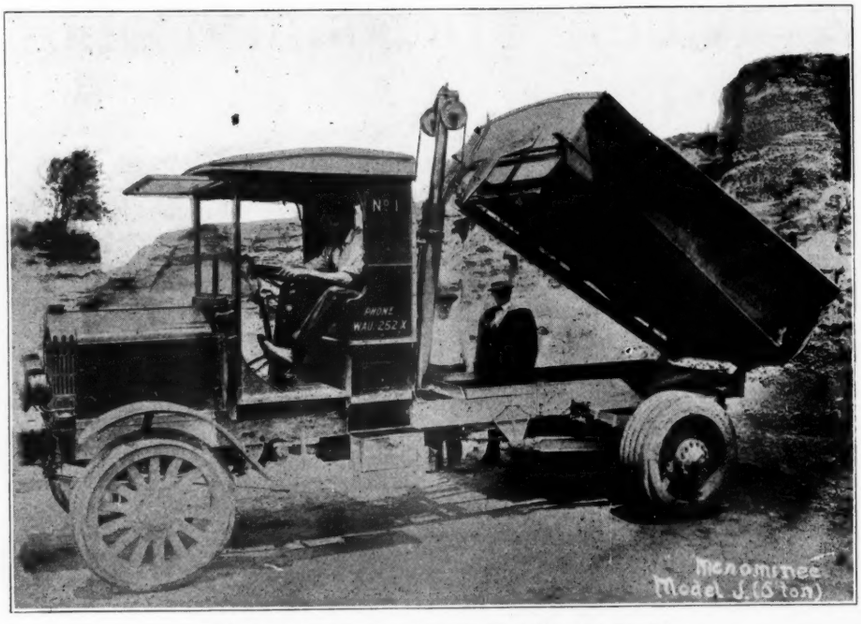
LINCOLN, Neb.—The Western Sand & Gravel Co. own and operate a sand plant on Capital Beach Lake near Lincoln, which lake and surrounding land has been purchased by the Central Realty & Investment Co. from the state of Nebraska, according to a letter from J. H. Johnson.

This corrects the report recently printed in Lincoln papers that the Nebraska Material Co. had obtained a lease on the lake and had been ordered to cease operations.

The sale of the land to the realty company has been ratified by the legislature, says Mr. Johnson, and "the Nebraska Material Co. have nothing whatever to do with any leases or sand operations on Capital Beach Lake." The Western Sand & Gravel Co. are loading sand from the lake at the present time and have never been interfered with by the state.

Huge Gravel Company

THE recent change in the charter of the Goodwin-Gallagher Sand & Gravel Corporation, New York City, permitting an increase in its capital stock from $2,000,000 to $8,000,000 probably makes this the biggest gravel concern in the world. The development of the huge deposits of sand and gravel on the north shore of Long Island has earned millions for this company.



End-dumping type only one feasible for gravel

Five Grades of Sand and Gravel Enough

R. E. Thomas of American Sand & Gravel Co., Submits Arguments and Proofs for His Contention

TWO GRADES OF SAND and three grades of gravel are enough to meet practically every demand and every requirement wherein these materials are used for the making of concrete is the opinion of R. E. Thomas of the American Sand & Gravel Co., Chicago, who are said to be the largest dealers in washed sand and gravel in the United States. They operate, control or handle the product of 16 or more pits in the states of Illinois, Indiana, Michigan and Wisconsin.

That this concern producing this limited number of varieties should develop and hold such an extensive business as they do is taken by them as proof positive of the correctness of their position in the matter. And they sell these five grades for every variety of concrete work in which sand and gravel are used.

Never Lost a Job

"We find five grades all-sufficient," said Mr. Thomas, "and we have never had any trouble in getting business. Having lost no jobs on account of our grades and grading, we believe that these five answer every possible need, and can see no good reasons for more for general purposes.

"The fact that in our business we easily satisfy all Chicago should be a potent argument in favor of our contention. And if Chicago with all its diversified needs and demands and requirements can be satisfied, it would appear that every other place in the country ought to be satisfied with five grades. We have virtually grown up on the five grades; at any rate we are persisting successfully in business and are still growing.

Elaborate Specifications Costly

"Elaborate specifications look smart on paper, but really are of no particular value, of no particular benefit. To fill them simply increases the trouble of production, increases the amount of labor in connection and therefore increases expenses.

"Why then make trouble and add to costs for the sake of a whim or a notion when something that is easily getable will answer every requirement?"

The Five Grades

The five grades produced by this company are as follows:

Number 1: Torpedo sand for plaster work and for brick work.

Number 2: Regular Torpedo sand for concrete work.

Number 5: Roofing gravel; ⅜ to ¼ inch.

Number 8: Gravel for reinforced concrete, for sidewalks, etc.; passes through 1¼-inch screen and is retained on ⅜-inch screen.

Number 9: For heavy concrete; sizes one to two inches.

"The fact that 3 grades are numbered respectively, 5, 8 and 9 may raise an inquiry," continued Mr. Thomas. "Well, there was a time when we did produce about ten grades, but gradually we eliminated all but five for the good reason that the five fill every requirement."

Supplied Biggest Jobs in City

The company are at present shipping Number 2 and Number 8 for the Government's new warehouse building in the Central Manufacturing District, which will take approximately 220,000 cu. yds. These two grades were furnished by the American company for the construction of the great Montgomery Ward & Co. and the Butler Bros. warehouses and the Calumet elevator at South Chicago, which are the three largest jobs Chicago ever had.

Apparently the American Sand & Gravel Co. believe in leeway in production of grades and in non-insistence on narrow hard limits in specifications. In this they appear to coincide with the views of Duff A. Abrams of the Lewis Institute Research Laboratory and W. P. Carmichael of Williamsport, Indiana.

The company report that on a recent day, they delivered at the Government warehouse job mentioned 82 cars of sand and gravel, averaging about 30 cu. yds. to a car, or a total shipment for the day of 2,460 cu. yds.

Chicago Gravel Men Boost Win-the-War Program

THE LOCAL association of sand and gravel producers of Chicago last week endorsed the movement begun by the Chicago Coöperative League of Building Trades and Industries to assist the Government in winning the war and in furtherance of that object to present evidence of the need of more Government building in Chicago and vicinity where the raw material of nearly all essentials is found and where labor and housing are abundant. Financial as well as moral support will be rendered to the league.

B. H. Atwood's New Company Buys Lake County Gravel Co.

Digging Down Below Water Line—Plant Electrically Equipped—Also Acquires Deposits in Wisconsin

THE Interstate Sand & Gravel Co. of Illinois, a recently incorporated enterprise of Burton H. Atwood, formerly of the Atwood-Davis Sand Co., Chicago, is already doing business, having purchased the plant, pits and 63 virgin acres of the Lake County Gravel Co. at Libertyville, Ill. In addition the new company have obtained gravel land in Kenosha county, Wisconsin, but will not erect a plant there until after the war.

The Libertyville property is a 25-car plant operated by electric power. While the present structures were erected and the equipment was installed only three years ago, the old company had been producing material for a much longer time. The pit has been worked for fifteen years.

No Changes in Equipment

Digging is done below the water line by a drag line excavator. As the excavator is continually being fed by springs, the company have a constantly growing fresh water lake which provides a side line for the corporation. The Lake County Gravel Co. cut ice every winter and Mr. Atwood states that he may do the same.

At present no changes are contemplated in the equipment; the screening facilities provide three grades of material, and two crushers are operated. The plant is situated on the Chicago, Milwaukee & St. Paul and the Chicago, North Shore & Milwaukee (electric) and has track connections with both roads.

Stanley Eaton Superintendent

Stanley Eaton, who was secretary-treasurer of the Lake County company is now superintendent of the Interstate. The Lake County company still maintains its corporate existence although it is not now operating. The business was established by George and W. I. Eaton.

Burton H. Atwood is president of the Interstate which is capitalized at $100,000, and F. V. Dunnebacke of Kenosha, Wis., is secretary-treasurer. The main office of the company is in the Chamber of Commerce, Chicago. There will be no change in the name of the Atwood-Davis Sand Co. of which W. C. Whitcomb of Rochelle, Ill., is president and A. S. Sorensen is secretary.

Electrical Equipment for Cement Mills

Requirements of Motors for Cement, Lime and Stone Plants—Types for Rough and Continuous Service*

CEMENT-MILL MOTORS must contend with dust that covers everything and which penetrates every crack and crevice. The same of course is true of motors in lime and rock-crushing and grinding plants. In cement plants they must often operate heavy machinery 24 hours a day and 7 days a week.

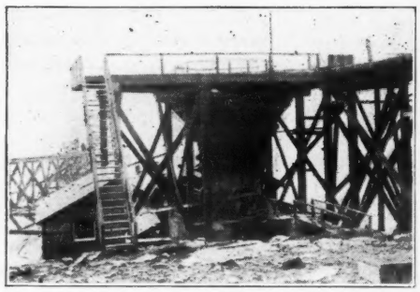
For the majority of cement-mill installations alternating-current squirrel-cage type motors are used. The aim in building these motors is simplicity, dust-proof bearings, no sliding electrical contacts and great mechanical strength to withstand shocks and stresses encountered in driving heavy machinery. The frames, except in the large sizes, are made of forged steel.

Machines like ball, tube and hammer mills, roll crushers, kilns and dryers, require several times as much power to start them as for running. Therefore the motors are supplied with an extra high starting torque. Jaw crushers and similar machines can be driven by motors with standard starting torque. Motors for these classes of service are made in many sizes up to 650 h.p.

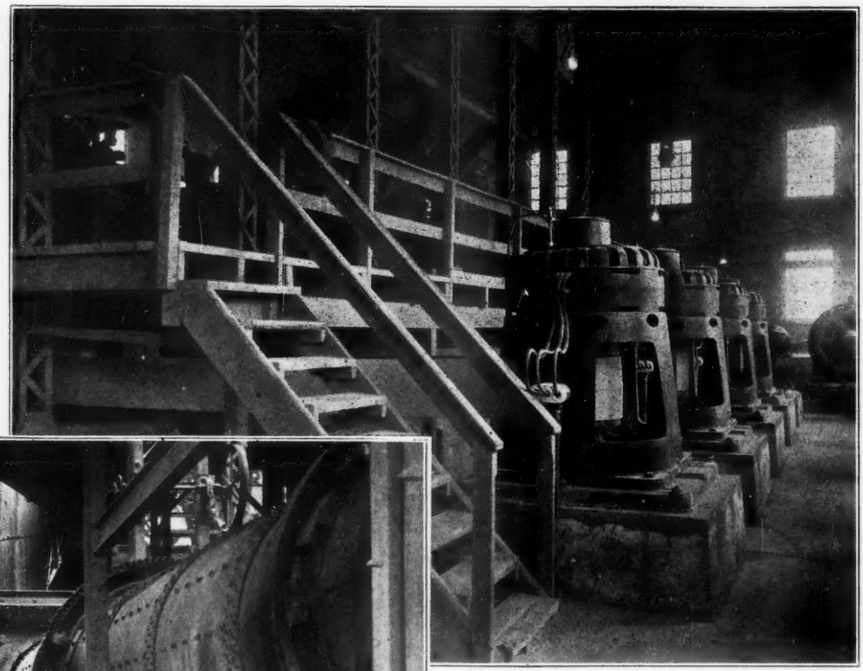
There are two classes of machines for which the squirrel cage type of motor is not suited; (1) machines requiring speed variation, such as kilns and hoists, and (2) very large machines requiring extraordinary high power for starting, like gyratory crushers. For both these types of machine the wound-rotor motor is used.

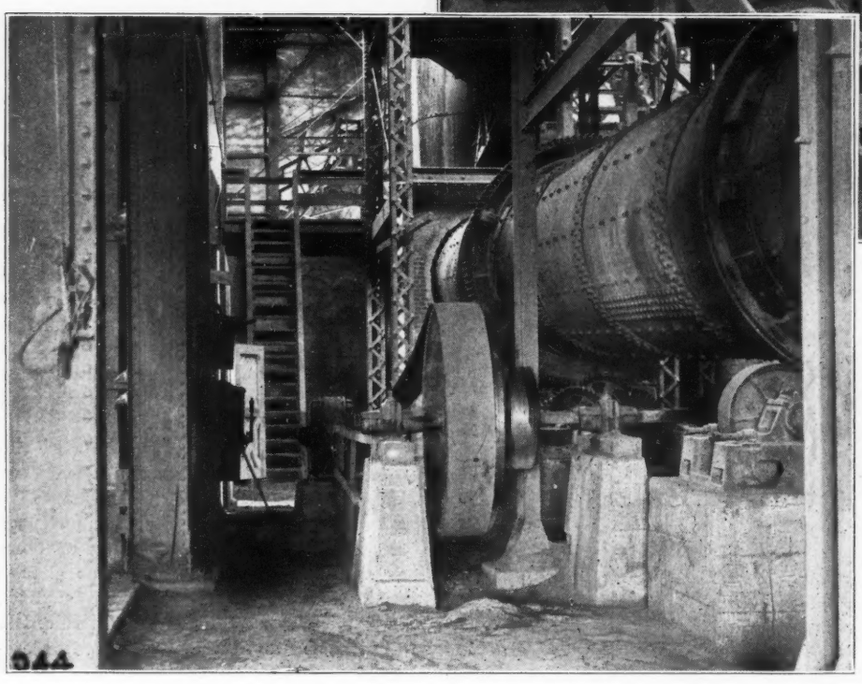
In the squirrel cage type of motor the rotor windings are heavy copper bars, short circuited at the ends by means of rings, while the wound-rotor motor has coil windings which terminate in slip rings on the rotor shaft. By means of brushes pressing on these slip rings, resistance can be introduced into the rotor circuit. By varying this resistance the speed of wound-rotor motor can be reduced or increased without drawing much more than full load power from the line, while starting the squirrel-cage type under the same load would draw an excessive amount of current from the circuit.

* Based on information from the Westinghouse Electric & Manufacturing Co.

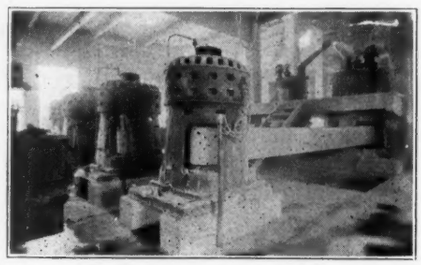


Above—Gyratory crusher driven by 300-h.p. direct current motor. Below—Rotary dryer driven by 50-h.p. squirrel-cage motor





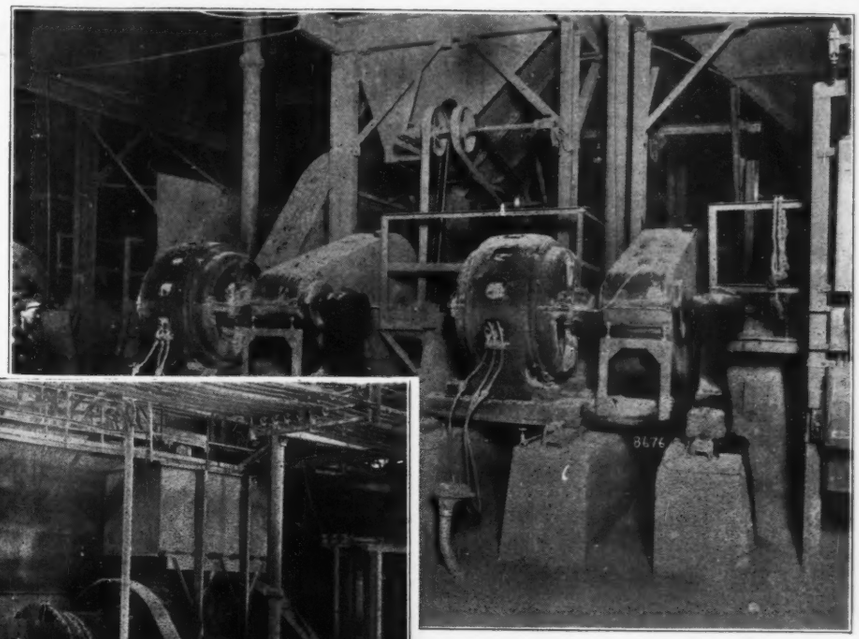
Fuller type of grinding mills driven by 75-h.p. vertical motors



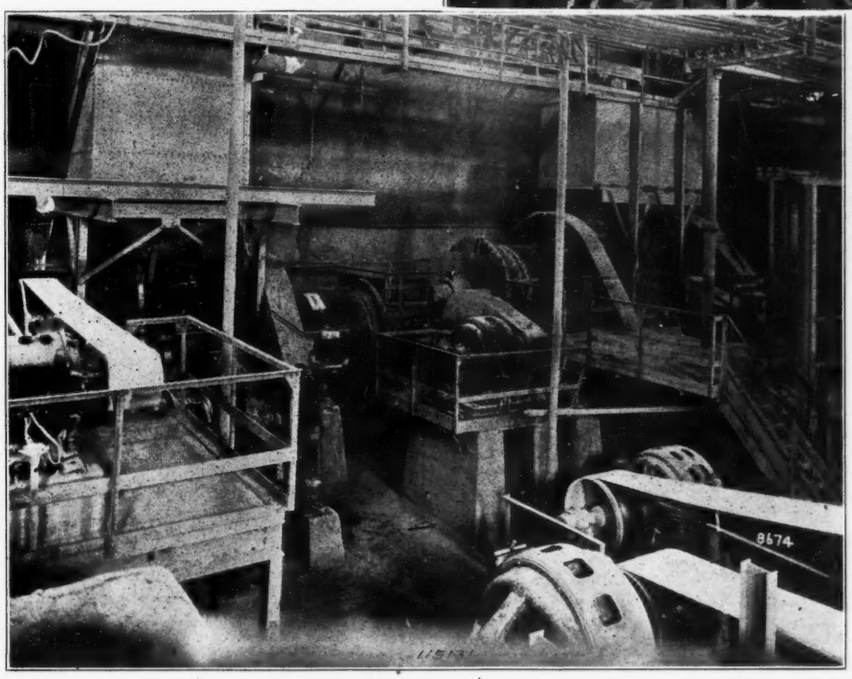
Another installation of vertical motors on grinding mills; these are 90-h.p.

Vertical motors of the squirrel cage type in sizes from 75 to 250 hp. are made for driving vertical grinders or pulverizers of the Griffen and Fuller types. Lubrication is accomplished by centrifugal action which forces oil upward through grooves in the shaft. These motors are also made for direct current.

Direct current is in use in some cement



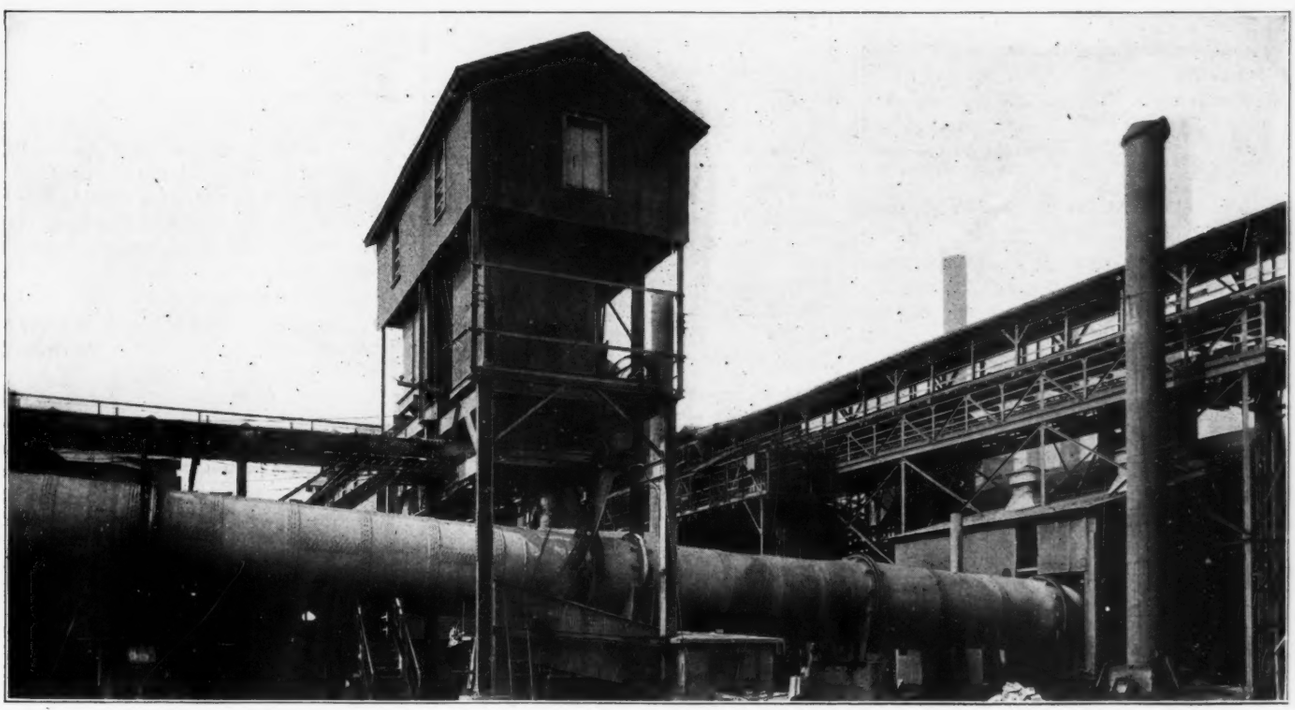
Below—Squirrel-cage induction motors, 300-h.p., driving ball tube mills; 250-h.p. wound-rotor motors driving tube mills



Above—Squirrel-cage induction motors driving ball tube mills

mills but alternating current is generally preferred because it can be transmitted long distances without the losses which occur with direct current. Alternating current motors are also more simple in construction and require less attention under the severe conditions of the service. The accompanying illustrations show installations of Westinghouse motors.

Below—Rotary kiln, 8x10 ft., driven by 30-h.p. wound-rotor induction motor



Cost Keeping for Crushed Stone Plants

Third Installment of a Series of Articles Based on the Practice of the General Crushed Stone Co., Easton, Penn.—Stone Orders, Material Orders, Filing Orders, Yearly Inventory, Pay Day, Etc.

SEVEN subjects under the divisional classification on page 25, of ROCK PRODUCTS, March 27, have been covered in the two previous articles under this heading. The present article starts with Division VIII—Stone Orders. The succeeding article will take up the most interesting part of the whole series—the distribution of cost.

VIII. Stone Orders

When an order for stone is received at the main office or local sales office, a copy of the same made up on a regular form is sent to the plant. This order gives the size and quantity of stone, shipping directions and where shipping notices are to be sent, also desired rate of shipment. As cars are shipped on this order, the number of tons is noted on the back of the order, which is ruled for this purpose, and the date of shipment. By means of this it can be readily ascertained when the order is completed or how many tons are still to be shipped. If orders cannot be shipped from the plant as desired on account of rush of business, immediate notification and reason for not shipping is sent to the office from which the order originated.

When the order is completed, the perforated end of the order, giving order number, consignee and date completed, must be torn off and sent to the main office. In cases where the plant receives an order direct, a regular shipping order in triplicate is made, giving all necessary shipping instructions, authority for order and price, if any is made. The original is sent to the Main Office, the first copy kept on the plant files and the second copy sent to the local sales office.

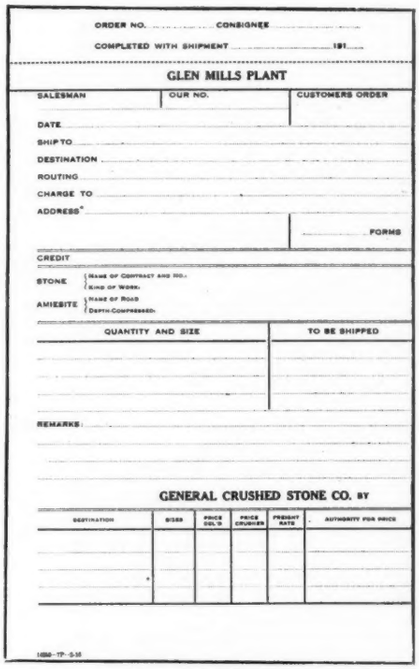
Alteration and Requisition Form—This form is used for what the name implies, viz: a slip filled out when a request is made to start or suspend shipments on any order or in case of a change of shipping address or any change whatever affecting the original order or last instructions. Three copies are made up, one copy to be attached to the order affected, one to be mailed to the Main Office and one to the local sales office.

IX. Material Orders

No material is purchased without an order. Forms are provided for this purpose. The original is sent to the people to whom the order is issued, a copy follows to the Main Office and another copy is placed on file at the plant. A form bill, and a printed request to the creditor to use it, goes out attached to each order, except as specified under Paragraph VII, "Certifying Bills."

Great care is taken to copy the order numbers in regular sequence and to show the plant initial in front of each number. Proper mailing instructions as to invoices are printed on the orders.

Material purchased locally is also covered by order forms. If such material is purchased in small quantities during each month and billed only at the end of the month, the requistion forms are issued for each purchase and are returned attached to the bill. A blanket order is then issued for the material as shown by the requisitions.


ORDER NO. ..... CONSIGNEE .....

COMPLETED WITH SHIPMENT ..... 191....

GLEN MILLS PLANT

SALESMAN | OUR NO. | CUSTOMERS ORDER

DATE .....

SHIP TO .....

DESTINATION .....

ROUTING .....

CHARGE TO .....

ADDRESS .....

..... FORMS

CREDIT

STONE { NAME OF CONTRACT AND NO.: KIND OF WORK:

AMIESITE { NAME OF ROAD DEPTH COMPRESSED:

QUANTITY AND SIZE | TO BE SHIPPED

REMARKS:

GENERAL CRUSHED STONE CO. BY

DESTINATION	SIZES	PRICE DELIV'D	PRICE CRUSHER	FREIGHT RATE	AUTHORITY FOR PRICE

1000-7P-5-18

Stone Order Form

Filing Orders

(a) Stone—When a stone order has been received and is being filled, it is filed in a loose leaf book where it may be readily referred to. Upon completion of the order it is put in the file provided for the purpose alphabetically arranged.

(b) Materials—When issued, orders are placed in the Shipman binder provided for the purpose. They are placed in numerical order—first in the back. They are also indexed at the back of the book, under the name of the firm to whom the order is issued.

Another index book is provided for indexing the different articles under a material classification showing the order number on which they were purchased. This cross index is provided to keep track of prices, as it shows the order numbers under which materials appear, prices having been entered on the orders. This is very important when making up the yearly repair part inventory to be described later.

Whenever a duplicate bill is not received for attachment to the order covering the same, the order with all the data appearing on the bill, as to prices and extensions, is entered, so that the order will then be a complete record of the transaction, for future reference.

On each order is also entered all freight and express charges, date of acknowledgement of the order, date of receipt of bill of lading, and any other information which may be necessary to keep track of the proper filling of the order.

Yearly Inventory

In addition to the supply inventory mentioned under Paragraph IV (a), an inventory at the end of each year, of all repair parts in stock at that time are required. This is made up on foolscap paper provided by the Main Office and is written in tabular form, leaving the right hand column for the prices.

It is completed and sent to the Main Office not later than January 10 of each year.

The price and, if possible, order number, are shown for each item, or class of items, such information being derived from the data which should be in the order book described in Paragraph IX.

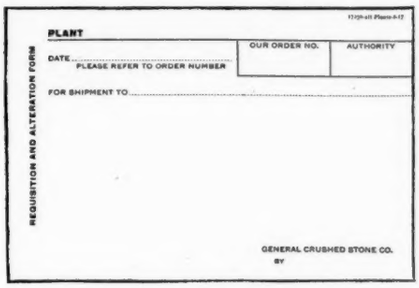
If material is not new a statement is made on the inventory and a price is made in accordance with the value of the material as at the date of the inventory as nearly as it can be estimated.

If the parts are those of a machine no longer in use at any of the plants, it is classified as "Scrap."

The inventory is made as accurately as possible. When there is no scale of sufficient capacity to weigh iron and steel bars sold by weight, the weights are computed from lengths of the bars, bolt ends, etc., from tables and catalogues, etc.

This work is started sufficiently early in December for an appeal to be made to the Main Office in case proper data is lacking at the Works Office.

The accuracy of the inventories in showing the material in stock at the end of the month and year is quite as important as


REQUISITION AND ALTERATION FORM

PLANT

DATE..... PLEASE REFER TO ORDER NUMBER

OUR ORDER NO. | AUTHORITY

FOR SHIPMENT TO.....

GENERAL CRUSHED STONE CO.

BY

Requisition and Alteration Form

accuracy of invoices and vouchers during the month in arriving at the cost of each operation. This is particularly true of the inventory reports of January first upon which it is relied to detect errors made in reports during the rest of the season.

The fuel on hand should agree within a few tons of the quantity called for by book inventory. Explosives can be readily verified by actual count.

Transfer of Material

Orders and bills are issued for all materials transferred from one plant to another, and from farm operations to stone crushing operations.

Pay Day

All the men, including the superintendent and time-keeper, are paid in cash every Saturday for the week ending the Saturday preceding.

Weekly time sheets are sent to the Main Office not later than Tuesday where they are checked, and a pay roll voucher and remittance for the total is sent to the superintendent on Wednesday or Thursday of the same week.

The time-keeper makes up a distribution sheet, giving the bank what denominations of currency are desired.

The superintendent and time-keeper enter on the envelopes previously stamped with the name of the plant and marked for the pay roll period covered, each man's number and the amount due him.

There are two counts on the money put in the envelopes, one by the superintendent and the other by the time-keeper, before sealing the envelopes.

The men are paid at the noon hour, or after the whistle blows in the evening, Saturdays. The time, however, can be decided by the superintendent.

As the men come to the window, they hand in the receipts slips before receiving their envelopes, and no envelopes should be given out without securing a receipt either signed by the man's name or his mark.

Any envelopes not called for are kept until such time as the man turns in his receipt. A safe method is to take the money, deposit it in the bank, giving the man a check when he calls for his pay.

Except when a man is discharged no money is given out before pay day.

Any money owed to a man, pay day for which is past, is paid to him in cash or by check at such time as he calls for it, after obtaining his receipt.

No money is paid to any man to whom it is not due, and no assignment of wages should be accepted unless in due legal form, or by written consent of the superintendent.

To be in due legal form the assignment receipt must have written on it at the bottom (below space for payee's signature) the words "To be paid to the order of ————" followed by the assignee's name if known. This order is signed both by the superintendent and the man who assigned his wages, and is finally signed by the person who draws the money. This signature is on the back of the receipt, if there is not enough space on the face, after obtaining all other signatures necessary. The superintendent's signature is placed in the left hand bottom corner.

All receipts are made out in ink or typewritten. Signatures are in ink wherever possible. All receipts are turned in to the Main Office.

Receipts are all stamped with the name of the plant of issue and show the pay roll period which they cover, and show each man's name if he can write and his mark if he cannot write. Signatures by number only are not accepted. If receipts are signed by mark only the time-keeper or superintendent's name followed by word "Witness" appear below the cross and words "His Mark." The foreman or any other responsible person present at time of payment also acts as a witness to such signature.

Payments are entered in the cash book under the head of "Pay Roll" showing the date paid. These are not necessarily to be itemized but may be put in a single entry. (See Cash Account Instructions.)

Test Volcanic Stone for Ship Concrete

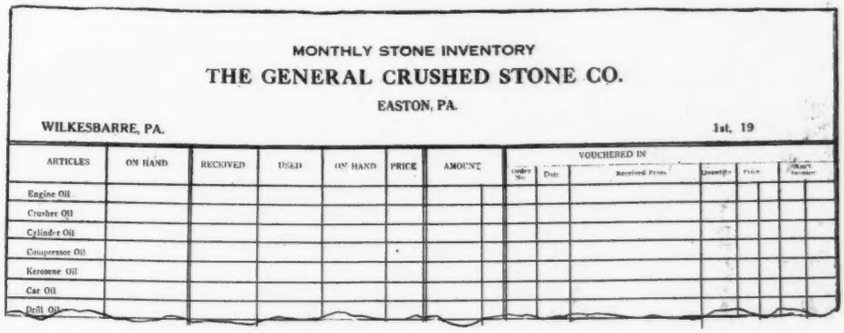
AUSTIN, Tex.—The engineering division of the Bureau of Economic Geology and Technology of the University of Texas has for the past three months been making tests of a light but strong volcanic stone found near El Paso for its adaptability to reinforced concrete ship construction. The tests were made for C. E. Barglebaugh of El Paso, who visited the University while on his way to Washington for a conference with the United States Shipping Board. Naturally the lightness of the material is an important factor in building concrete ships, and the fact that there is in Texas a volcanic stone which has the necessary tensile strength as well as an unusual lightness of weight makes it all the more probable that the new industry will be established at Texas ports on a more or less extensive scale.

Plans are on foot for the construction of a number of concrete ships at Port Aransas with this West Texas volcanic stone.

Domestic Lithograph Stone in 1917

IN a statement made to the United States Geological Survey, Department of the Interior, the Kentucky Lithographic Stone Co., whose quarry is at Brandenburg, Ky., reported sales of 5,832 pounds of lithographic stone in 1917—considerably less than was sold in 1916. The decrease was due largely to obstacles which kept the quarry idle for six months. The shipments in 1917 were made to the same points as in 1916—Boston, New York, Cleveland, and less distant cities.

The continued demand from the same markets and the fact that the demand in 1917 exceeded the company's ability to supply it were encouraging in spite of the obstacles that attend the development of a new industry. The main difficulty has been the handling and disposing of a large quantity of limestone that lies above and between the three beds of lithographic stone. Plans made to build a spur track to the quarry from the Louisville, Henderson & St. Louis Railway have been delayed by difficulties in obtaining a right of way, and owing to the present unfavorable conditions of transportation the quarry was not operated continuously. The track is now reported to be under construction, and when it is completed the company will use it to ship a large quantity of by-product stone, in the form of crushed stone, furnace flux, pulverized agricultural stone, chicken grit, and other products. A crusher and a pulverizer are installed and even under the poor conditions that prevailed in 1917 small quantities of these products and of honestones were marketed.


MONTHLY STONE INVENTORY

THE GENERAL CRUSHED STONE CO.

EASTON, PA.

WILKESBARRE, PA. 1st, 19

ARTICLES	ON HAND	RECEIVED	USED	ON HAND	PRICE	AMOUNT	VOUCHERED IN					
							Order No.	Date	Received From	Quantity	Price	Amount
Engine Oil												
Crusher Oil												
Cylinder Oil												
Compressor Oil												
Kerosene Oil												
Car Oil												
Drill Oil												

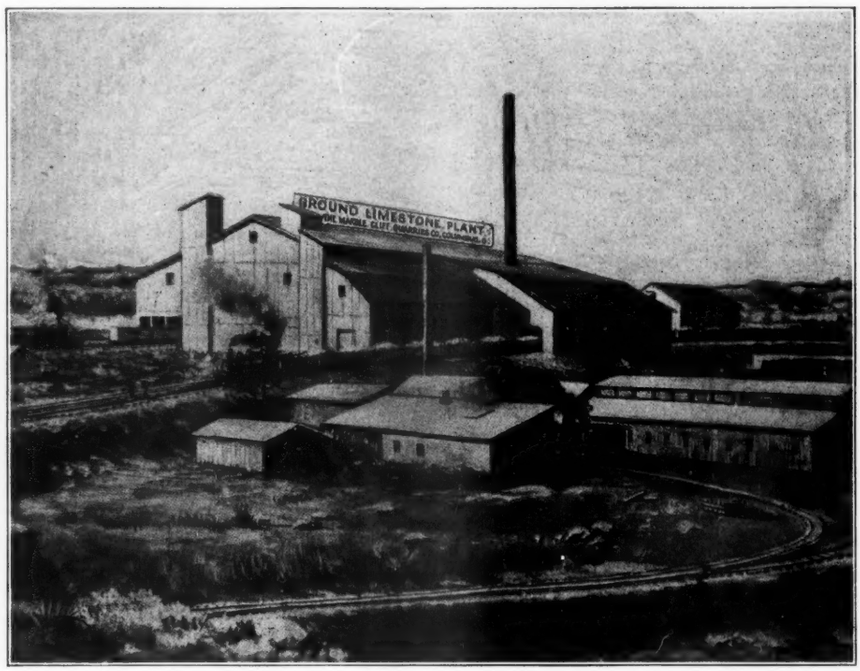
Monthly Inventory Blank referred to on page 25, April 10 issue

Marble Cliff Quarries Company Building Up-to-Date Dust Plant

Work Progressing on 600-Ton per Day Plant at Columbus, Ohio

THE Marble Cliff Quarries Co., of Columbus, Ohio, operates one of the largest limestone industries in the United States. Including the agricultural limestone mill, there are seven plants stretched along the Scioto river. A large proportion of the stone is sold to the steel mills and blast furnaces for fluxing, the rest goes for railway ballast, road construction and concrete work. All of the quarries are inter-connected by railroad tracks. In one place a tunnel has been blasted under a public highway to connect the main quarries. Twenty-two locomotives and about 140 cars of different types are required to handle the material in the quarries and take it from one plant to another. If quarry operations are suspended in any plant it is supplied by stone hauled from another quarry.

On the surface, along the side of one of the largest quarries, an elevated track has been constructed which ends over five great storage bins, beneath which are wagon tracks. Stone is hauled by the locomotives to these bins in hopper bottom cars. It is drawn from beneath to trucks or wagons for road and concrete work.



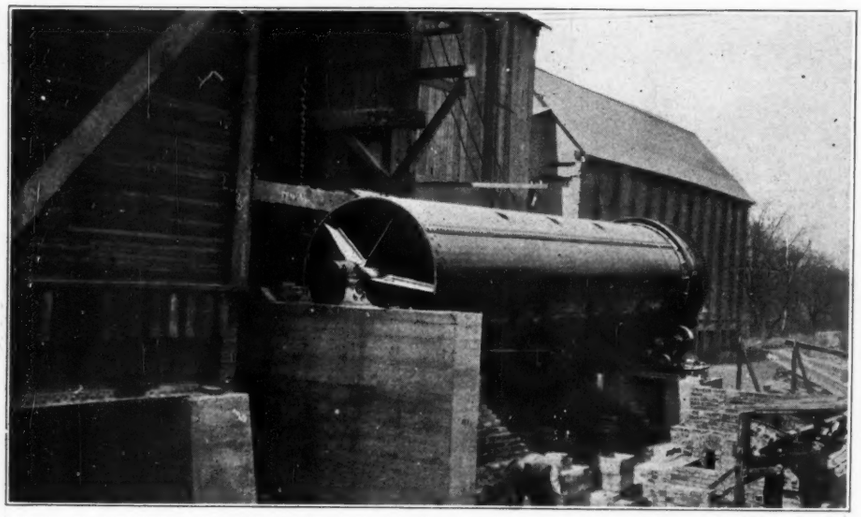
Agricultural lime plant of the Marble Cliff Quarries, as it will look when completed

Kerosene for Power

In operating the quarries, eleven steam shovels, ranging from 65 to 100 tons, eleven well drills, and thirteen air drills are used. The well drills are operated by gasoline motors in which kerosene instead of gasoline is burned. This is made possible by an invention of one of the drillers, who has a device, which after the motor is started with gasoline, will operate on kerosene just as efficiently and at much less cost.

Crusher Equipment

The gyratory crushers are most of them large size because of the fact that a large portion of the stone goes to the steel mills and is not broken as small as the regular road and building material. The different plants are designated by letters. Plant A is equipped with a No. 10 and a No. 6 crusher and produces ballast and road stone. Plant B has a No. 21 and a No. 8 and produces fluxing stone. This plant is equipped with steel storage bins. Plant C has a No. 21, No. 7½, and two No. 6's. It also has steel bins. The stone is used for fluxing and ballast. Plant D is the agricultural limestone mill. Plant E has a No. 8, No. 6 and No. 5 and produces road building material. Plant G has a No. 8 and a No. 6 crusher. Screens and elevators are in keeping with the crusher equipment.



Installing limestone dryer and automatic stoker at Marble Cliff Quarries plant

Increase Capacity of Pulverizing Plant

There is also a locomotive crane for handling material and coal from storage piles and other purposes.

The company is just completing new buildings and installing new equipment which will increase the present modest production of agricultural limestone to about 600 tons per ten hour day. A small agricultural limestone plant has been operated for some time but the new equipment will increase its capacity more than five times.

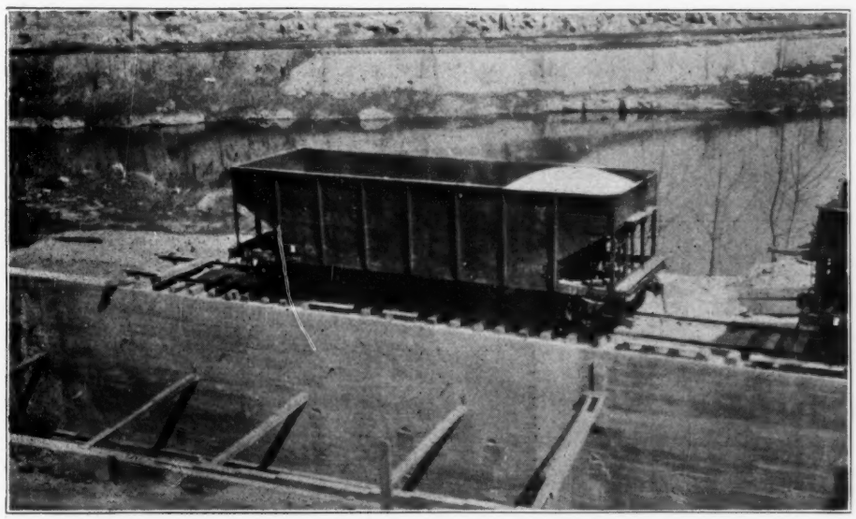
In the original plant only one pulverizer

was used. A second was installed when the market for agricultural lime began to expand some time ago and now three more are being added, together with a 35-ton an hour dryer and storage bins, scalpers, screens two four-unit bagging machines and much new conveying machinery.

Use Screenings

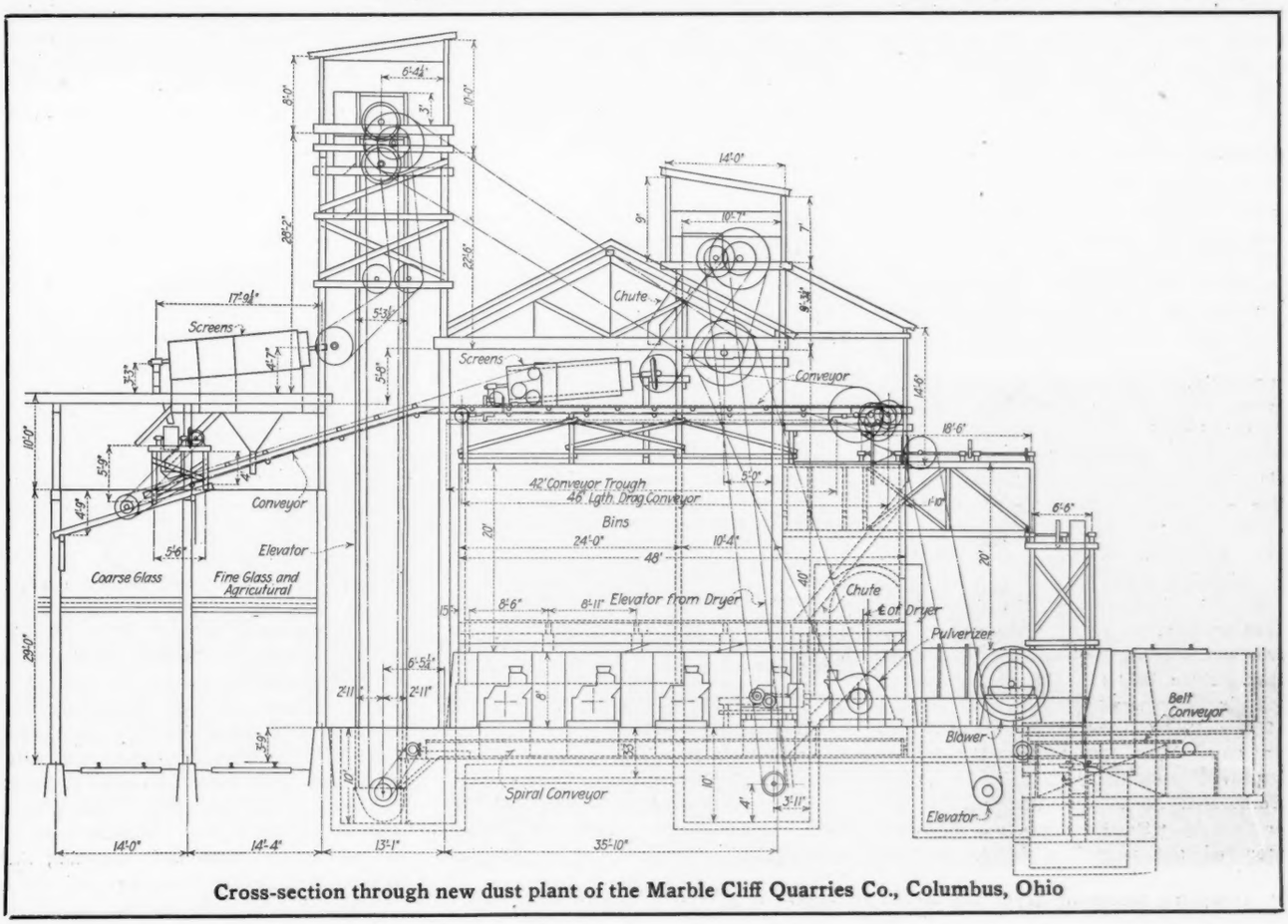
The screenings from the five crushing plants in the string of quarries which stretch for three miles, half a mile wide, along each side of the Scioto river, will be used in the agricultural lime plant, and if it is found that the screenings do not accumulate fast enough to keep the mill in operation the pulverizers will be so arranged that 3-in. stone can be used, always insuring plenty of material to keep the plant going. There is a storage pile of 175,000 tons of old screenings to draw on.

The screenings are brought to the dust mill in hopper cars, which discharge into a pit beneath the tracks from which a short belt conveyor takes them to the dryer and



Concrete storage bin of 500 tons capacity with belt conveyor discharge; for side dumping cars

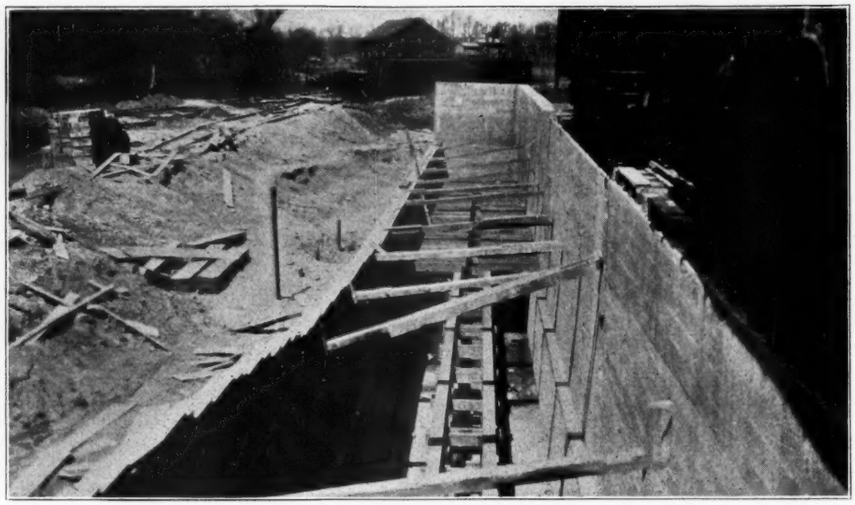
Entrance to concrete hopper for bottom-dump cars; belt conveyor discharge



Cross-section through new dust plant of the Marble Cliff Quarries Co., Columbus, Ohio

by elevator to a set of scalpers and screens. The fine dust goes by conveyor to the finishing screens, the rejections into a 500-ton storage bin, beneath which will be located the five pulverizers. From the pulverizers it is taken by elevator to the finishing screens from which the dust flows to the bins above the loading track or is taken by belt conveyor to the big storage bin at one end of the plant, or by by-pass and trippers on the conveyors to the hoppers above the bagging machines. The equipment in the dust mill will consist of one 35-ton per hour dryer, five pulverizers, elevators, two four-unit bagging machines and the necessary screens and scalpers. Screens and scalpers are manufactured in the company's own machine shops.

The president of the company is W. H. Hoagland, a pioneer promoter of agricultural limestone. The manager of the lime department is Frank F. Coglan.



Another view of concrete storage bin under construction

What Liming of Soils Means in Increased Crops

Statistics Marshaled by G. J. Wilder, Manager of the Agricultural Lime and Limestone Association

THE UNITED STATES BUREAU OF CENSUS report has established beyond question the following facts: During the last decade the population of contiguous continental United States increased by 31 per cent; or by sixteen million people, while the production of all food grains increased by less than 2 per cent; (from 4,439 million bushels to 4,513 million bushels) and from June 1, 1900, to April 15, 1910, the number of food producing animals (cattle, sheep and swine) decreased by 10 per cent (from 193 million head to 173 million head).

We fed our increase of population (during this time of peace) by reducing the standards of living and by decreasing our exportation of foodstuffs. Meat and eggs have been much boycotted by many families. The Governmental records of two five-year averages, centered on 1900-10 respectively, show that our average annual exportations decreased during the decade from 215 million to 103 million bushels of wheat, from 162 million to 48 million bushels of corn, from 1,535 million to 990 million pounds of pork and pork products, from 635 million to 357 million pounds of beef, and from 416 thousand to 190 thousand head of cattle.

Almost coincident with the close of the 19th century, we reached the end of our free Government lands suited to agriculture. From 1890 to 1900 the increase of land in farms was 34 per cent; while from 1900 to 1910 the increase was less than 5 per cent. From 1880 to 1910 the area of improved farm land in New England, New York, New Jersey and Pennsylvania decreased by 9,800,000 acres, an aggregate area of agriculturally abandoned land which exceeds the combined area of Massachusetts, Rhode Island and Connecticut; that even the State of Ohio agriculturally abandoned 16,000 acres of land during the same ten years; all these are established facts, that any man can verify by turning to the United States Census report, and not mere opinions. They point unmistakably toward future poverty for this country unless we adopt means and methods to increase production of foodstuffs.

By soil enrichment alone, the crop production of the United States could be doubled, and by no other means could such an achievement be accomplished. This will require, on the normal soil of the great corn and wheat states only liberal use of such natural materials as lime, legume crops, farm manure and phosphorous, and railroads should either willingly, or by Governmental direction, establish low freights, not exceeding one-half cent per ton-mile for the shipment of lime and limestone, for the future of both commerce and industry depends on soil enrichment and preservation.

THE Manager of The Agricultural Lime and Limestone Association, whose statistics are quoted here, was born at Avon, Lorain County, Ohio, in 1881. He was graduated at the Ohio State University in agriculture in 1906, having specialized in soils, dairying and livestock.

His early experience in farm management was on John D. Rockefeller's Forest Hill Estate at Cleveland, Ohio, where he was Assistant Superintendent. From 1907 to 1914 he was farm manager of the Cleveland City Farms.

Mr. Wilder therefore has a most thorough and accurate knowledge of real farming and farmers' problems. He recognizes the fact that agriculture is a direct science based on fundamental facts. He sees that soil should be fed balanced rations, just the same as livestock is fed balanced rations for the highest returns.

Prof. Chas. E. Thorne, Director of Ohio Agriculture Experimental Station, said in an address at the Home Products Exposition in Columbus, that "unless acres bring more, the price of living is bound to go higher," and that "the whole eastern half of the agricultural area of the State of Ohio should be covered with an inch of carbonate of lime."

Government statistics show that the State of Ohio has 24,105,708 acres under cultivation. If one-half of this acreage should be supplied with lime in proportion as above advised, it would give to the railroads of the State of Ohio, 2,340,724,511 tons of lime to transport; this, figured at the minimum rate of 25 cents per ton, would give to the railroads of the State of Ohio, a revenue of $585,181,127.

During the year 1916 there was shipped by the manufacturers of Ohio less than 200,000 tons for agricultural purposes; this fact stands out in bold relief; and when it is considered that no less an authority than Prof. Chas. E. Thorne has published and circularized over the State of Ohio the following: "When the land begins to need lime it is a waste of time, energy and money to continue cultivating it until this need is supplied, for the economical use of every other fertilizing materials, including manure, depends upon the lime supply; if that is deficient everything else must fall short of its possible attainment. Not only is lime one of the essential constituents of every living cell, without which there can be no life, either of plant or animal, but it performs other functions in the soil, the importance of which is scarcely secondary to that of directly feeding the plant."

Agricultural Lime Bureau of the National Lime Manufacturers Association

Its Function and Commercial Value to the Lime Industry

By Henry M. Camp, Director

THE APPLICATION OF LIME to soils for the purpose of increasing crop yields has been followed throughout the entire world, and dates back more than three thousand years.

Yet, with this most common of all agricultural practice, we find upon investigation of the condition of the soils of this country, that millions of acres of tillable land would in all probabilities produce much greater yields if treated regularly and properly with lime.

The writer attended the annual meeting of the National Agricultural Society at Washington several months ago, and heard the distinguished agricultural scientist, Dr. H. J. Wheeler, former Director of the Rhode Island Experiment Station, speak on the subject of the agricultural possibilities of this country. Dr. Wheeler, in referring to the treatment of soils for greater productivity, said:

There are at least 200 million acres of land in 20 states in the South, East, and Middle West which are in immediate need of liming, not to mention extensive areas elsewhere; and doubtless this estimate is too low. None of these lands can be made to yield full returns from the use of cover crops, manure, and fertilizers, nor can the labor of tilling such soils be applied to the best advantage until they are limed. The proper liming of all of these soils would entail, if done at once, the application of 200 to 300 million tons of lime the coming year, instead of our using an amount probably ranging from 600,000 to 700,000 tons. Thus it will be seen how inadequately this great need of American soils is being met, and how great is the necessity for calling attention repeatedly to this matter.

It has often been wondered where all the lime required under the recommendation of Dr. Wheeler would come from, if his advice on its use was heeded by the farmers of the territory mentioned for the reason that the present demand of the lime industry of the country results in an annual production of only about 4,500,000 tons for building, chemical and agricultural purposes.

The Agricultural Lime Bureau—its Organization and Function

The Agricultural Lime Bureau was founded in August, 1916, by a group of lime producers of the Eastern section of the United States who wanted themselves to know more about the use of their product in agriculture. These progressive manufacturers met in Washington one day and heard a report which the writer had been requested to prepare on the practicability and commercial value of the operation of a Bureau for the primary purpose of conducting a general scientific study and practical demonstration of the use of lime in the treatment of the soil for greater productivity; to disseminate results of such investigational and research work in the form of educational news articles to the press; in bulletins and pamphlets on general and special subjects on the use of lime

Henry M. Camp

in agriculture, both for professional and commercial distribution; to further encourage and aim to promote such study and field tests at Federal and State Agricultural Institutions, as may properly be justified from the standpoint of the local importance of the availability and proper agricultural use of the different liming products, and to engage otherwise in such work of a constructive nature that would be of service to the public and to the lime manufacturer for the better understanding of the more efficient use of lime for the maintenance and the improvement of the fertility of soils.

The foregoing plan as proposed, appealed to the majority of producers present, about twelve in number, who forthwith agreed to co-operate to the support of the work of the Bureau for the period of a year, in such amount as it was estimated would be needed.

An Advisory Committee of manufacturers was chosen, rules and regulations governing the conduct of the Bureau work were adopted, and a headquarters opened at Washington, D. C. Henry M. Camp was appointed by the Committee, Director of the Bureau, and Mr. Camp chose Dr. Karl Langenbeck, Soil Chemist, as the one to be in charge of its Technical Department.

Companies Subscribing to the Fund for the First Year's Work of the Bureau

Following are the companies arranged by manufacturing districts, that subscribed to the support of the Bureau work for its first year of service:

NEW YORK MANUFACTURING DISTRICT

Dutchess County Lime Company, Dover Plains, N. Y.

PENNSYLVANIA MANUFACTURING DISTRICT.

Palmer Lime & Cement Co., New York City.
Knickerbocker Lime Company, Philadelphia, Pa.
Charles Warner Company, Wilmington, Del.
J. E. Baker Company, York, Pa.
Steacy & Wilton Co., Wrightsville, Pa.
Merion Lime & Stone Co., Norristown, Pa.

MARYLAND MANUFACTURING DISTRICT

S. S. Barrick & Sons, Woodsboro, Md.
Tidewater Portland Cement Co., Baltimore, Md.
Fountain Rock Lime Company, Woodsboro, Md.
M. J. Grove Lime Company, Lime Kiln, Md.
Washington Bldg. Lime Co., Buckeystown, Md.

WEST VIRGINIA MANUFACTURING DISTRICT

Security Cement & Lime Co., Hagerstown, Md.

VIRGINIA MANUFACTURING DISTRICT

Riverton Lime Company, Riverton, Va.
Shenandoah Lime Company, Strasburg Junction, Va.
Rockdale Lime Company, Toms Brook, Va.
Leesburg Lime Company, Leesburg, Va.
Powhatan Lime Company, Strasburg Junction, Va.

The following producers composed the Advisory Committee of the Bureau for its first year of service to the industry: Charles C. Bye, Chairman, Charles Warner Co.; J. K. Barbour, treasurer, Security Cement & Lime Co.; Richard McCoy, Powhatan Lime Co.; Charles R. Leo, Palmer Lime & Cement Co.; E. R. Stapleton, Tidewater Portland Cement Co.; J. L. Durnell, Knickerbocker Lime Co.; Paul M. Pierson, Dutchess County Lime Co.

Working Territory of the Bureau

The working territory of the Bureau was laid out so as to embrace the sales territories of all the subscribing companies, and consisted of the following: The South-

ern Section of New York State, New Jersey, Eastern Pennsylvania, Maryland, Delaware, Virginia, and West Virginia.

In the conduct of its work, the Bureau has found that the agriculture of each state or section covered by the service of the Bureau, varies considerably, presenting new and difficult problems. For instance, the type of farming changes from "intensive" to "extensive," from market gardening to general farming; soils change from state to state, and the kinds of lime obtainable vary according to the limitations of manufacturers and transportation facilities. These conditions make the work very diversified and much study necessary to keep thoroughly informed on all existing conditions throughout the entire Bureau territory.

Business Management of the Bureau

The general management of the Bureau is in charge of a Director who is appointed by the Executive Committee. The Director has direct supervision over all correspondence of the Bureau; the study of all projects to be developed by the Bureau, including field investigations of both a business and technical nature, and such other branches of the Bureau's service as relate to the general conduct of its work. The Director also acts as Secretary of the Executive Committee of the Bureau and as Secretary of the War Service Committee of the National Lime Manufacturers' Association.

The Bureau issues monthly a report of its work consisting of an outline in detail of the service which it is conducting for its member companies. Through the medium of this report, its companies are kept in constant touch with the progress of the Bureau work and the special subjects and investigations in which it is engaged for the study and promotion of the use of lime in agriculture. These reports include a full record of the achievements of the Bureau and contain special matter of commercial value to the sales work of the lime company. The monthly report is practically a diary of the Bureau work and affords the member company the opportunity of knowing exactly the methods employed by the Bureau for the accomplishment of its objects and purposes, in order that the member, if he sees fit, can make suggestions as to new lines of effort or changes in existing procedure for the improvement of the Bureau service.

Scientific Department of the Bureau

The technical work of the Bureau is divided into two departments, a Division of Chemistry and a Division of Agronomy. The Division of Chemistry is in direct charge of the study of the chemistry of soils and the conduct of investigations of the unsolved problems of the use of lime in soil treatment which are brought to the attention of the Bureau from time to time. The Chemist of the Bureau, in this effort, confers regularly with the scientists of the official State and Federal agricultural institutions, and through concentrated application to the subject of soil liming, the Bureau hopes to develop new uses for lime in agriculture, as well as to bring about an improvement in the present practices of soil liming.

Among the other lines of work in which the Division of Chemistry is engaged, are the development of the chemical and mechanical standardizations of lime products used in agriculture; the investigation of the comparative costs of the private and commercial grinding of limestone to determine if the former is really an economic operation under the various conditions that exist; the preparation of technical matter on the results of the studies and investigations engaged in, for use by scientific magazines; the visiting regularly of all agricultural colleges and experiment stations of the Bureau's working territory in order to keep in personal touch with the work of these institutions as it may relate to the chemistry of soils. In fact, this department of the Bureau work is one which is devoted entirely to the science of the use of lime in soil treatment—a fundamental study that has been neglected and which is now found to be of the greatest importance to the general success of the service of the Bureau.

The work of the Division of Agronomy of the Bureau is in charge of John H. Voorhees, formerly Extension Specialist in Agronomy at the New Jersey Agricultural Experiment Station, and includes the study and practical farming demonstration of the use of lime for the growing of the various crops requiring either a neutral or alkaline soil for their maximum yields. In brief, this division has supervision over all practical demonstrations of the use of lime conducted by the Bureau in co-operation with Federal Agricultural County Agents; it maintains a complete library of all publications of official and private agricultural institutions of a nature that are needed in the study of the fertility of soils and the growing of crops; conducts the correspondence with agricultural colleges and experiment stations, lime manufacturers and the public on all technical subjects relating to the use of lime in agriculture; prepares pamphlets and bulletins, educational news articles for the Bureau's copy and plate service to newspapers; prepares lecture matter for County Agents and Farmer's Institutes; keeps in active touch with the liming studies and field investigations of all Experiment Stations of the working territory of the Bureau, and co-operates generally in a subordinate way with officials of the Department of Agriculture, State Colleges, County Demonstrators, and other State and Federal agricultural officials on matters relating to the use of lime for the maintenance of the fertility of soils.

Relations of Scientific Department of the Bureau with the Department of Agriculture

On the conduct of its scientific work, the Bureau enjoys the valuable co-operation of the Department of Agriculture at Washington. The Division of Chemical Investigations of the Bureau of Soils is now engaged in a number of studies and experiments on the chemistry of soil liming. At present this Bureau of the Government is giving special study to the relative solubility of the different forms of lime, which it is felt, when completed, will contribute very materially to the more effective use of lime in soil improvement. The Bureau of Soils has been of very great service to our Bureau in the valuable assistance that it has rendered to our technical department and too much recognition cannot be given by the lime industry of this co-operation to the study of our scientific problem.

The Bureau of Plant Industry and the States Relation Service, are both giving earnest study to the proper liming of soils, in their respective services to the agricultural development of the country, the former in its investigations of the use of lime for the different crops, and the latter in its personal work with farmers through the aid of County Agents.

The Bureau has derived a distinct benefit from its relationship with the Department of Agriculture, and the satisfactory progress being made by our technical workers is largely due to the value of the counsel with the scientists of the Department on the numerous agricultural problems that come up regularly in the Bureau work.

Review of Experiment Station Literature

The technical department of the Bureau maintains a library of the publications of the Experiment Stations located in its territory. These are thoroughly studied, indexed and filed for reference. In this way, the Bureau is enabled to inform itself of the experimental work done in the various states and to urge upon Experiment Station workers greater efforts and a broader minded policy in studying and teaching the principles governing the use of lime in agriculture.

Two examples of successful effort along this line may be cited. The Pennsylvania Experiment Station has just outlined two sets of plot tests to study the use of lime on two different types of soil. One test is to be made on the Volusia loam in Bradford County, and one on the Westmoreland soils of Washington County. In both series of experiments, ground limestone is to be compared with hydrated lime as contrasted with the experiments in Centre County where only ground limestone was used. In a similar manner, the New Jersey Experiment Station has recently planned some experiments with the use of hydrated lime on tomatoes as an earnest endeavor to clear up existing controversy questioning

the value of lime in the production of canhouse tomatoes.

State Agricultural Colleges and Experiment Stations

There is no work of the Bureau more important to its success than that of maintaining a progressive relationship with State Colleges and Experiment Stations. These official institutions are constantly engaged in the study of the liming problem and in the conduct of practical demonstrations with the use of the various forms of liming material in the growing of the different food, forage and soil improving crops. Our scientists have always found the officials of colleges and stations ready and willing to co-operate.

Farmers' Institutes

The plan of the Bureau to conduct lime lectures with charts and lantern slides will be carried out actively a little later on, now that the Bureau has been successful in the development of a number of practical demonstrations with all forms of lime on privately owned farms, in co-operation with county agricultural agents. We will shortly be fortified with some interesting and effective data which will be of material advantage to the success of our lecture work of the future.

County Agents

One of the chief functions of the field work of the Bureau is to aim to have county agents accept the co-operation of our scientists. In this feature of our technical service, we are making fair progress and believe the plan to be practical, although the feeling still seems to exist that the scientific department of an industrial bureau may be involved too much with the selfish interests. This condition merely requires the proper degree of consideration, as it is only reasonable that any industry selling its product for an agricultural use will adopt only such methods of sales promotion as are proper; to do otherwise would be folly; furthermore, our scientists would not for a minute engage in any line of work, in the following of their profession, that is not strictly in line with scientific doctrine and practice.

Co-operative Liming Experiments Conducted on Privately Owned Farms

Perhaps, the most important line of work recently developed by the Bureau is the establishment of plot tests on privately owned farms for comparing the various forms of lime. These tests are run by farmers in the different states, and all work is done in co-operation with County Agricultural Agents located in the various States, who supervise the work and furnish the Bureau with a report of the results of each test. So far, the Bureau has established 129 of these experimental tests which are calculated to establish principles regulating the use of lime in all of the communities in which they are conducted.

The information obtained through the tests will be collected by the County Agent who will use it in lecture work throughout his county at meetings of farmers' institutes, granges, picnics and the like. In view of the fact that it is estimated that 85 per cent of the soils east of the Mississippi are acid, and the universal opinion among county agents and up-to-date farmers that lime correctly used is always accompanied by increased crop production and better tilth or condition of soils, it is believed that much good will be derived from this effort mainly through the publicity which is bound to follow. The Bureau will have the results of these tests to use in its copy and plate service to daily and weekly newspapers. This will enable the Bureau to make its news service local in nature which is a most valuable asset in all publicity work.

Publicity Service—Copy and Plate Service

The Bureau maintains a news service to 1,200 weekly and 237 daily newspapers in its working territory. The copy distributed to these papers is based on the best information obtainable, varied to please the reader, to suit the season, and includes articles on a variety of subjects though most touch upon the use of lime either primarily or incidentally.

The plate service of the Bureau is furnished to 400 weekly papers of the agricultural sections of the Bureau's territory. The majority of the articles relate to questions of soil fertility involving the use of lime. The plate is distributed regularly to 200 newspapers a month in the working territory of the Bureau.

Publications of the Bureau

The Bureau publishes bulletins and pamphlets from time to time on up-to-date subjects having to do with the use of lime in agriculture. These are prepared in both scientific and popular form and are circulated to a large free list of experiment station workers, county agricultural agents, manufacturers of lime spreaders, railroad agricultural departments, farmers' institute workers, boys' club readers, and sold to the manufacturers of lime for use in their sales work at very low figures.

The publications of the Bureau that have so far been issued include, "The Practical Advantages of Burned Limes Over Ground Limestone," "Facts About the Use of Lime in Agriculture," "The Humus Supply of Soils," "The Prescription Method of Liming Soils," "The Home Garden," "Bacterial Activity," "Trading Lime for Potash," "Potash, Lime and the Potato Scab," and "Potato Planting." Others are now in the course of preparation which will be issued in the regular manner.

Bureau of Information

The Bureau maintains a technical information service for its subscribing companies where questions relating to general agricultural practice are given study and research. This service is of special value to the sales department of the lime companies in that it is always available for reliable information on any agricultural subject. In the conduct of this feature of the work, the Bureau frequently confers with scientists of the Department of Agriculture, where it is possible to obtain the fullest co-operation in our study of all subjects that are referred to us for investigation.

Our Allied Industries

Among the industries with close business alliance with the agricultural lime industry, are the commercial fertilizer industry, the seed industry, the fertilizer and lime sower manufacturers, and the laboratories producing nitrogen fixing bacteria. There is no doubt of the commercial value of an active and harmonious relationship with all of the foregoing industries, and such a policy has been in existence for sometime with the Bureau. Already, our relationship with the bureaus of the commercial fertilizer industry has shown some very productive results in our success in bringing about a co-operative working agreement, whereby the uses of our respective products in soil fertilization are properly presented in all publicity and other propaganda work. With the cordial and helpful relationship now established with the fertilizer industry, attention will be given to the seed industry, the farm machinery industry and such other industries that relate to our general work.

Soil Testing and Farm Service Laboratory

Through a mutual co-ordination of the resources of our allied industries, the Bureau has recently effected arrangements for the establishment of a soil testing and farm service laboratory, which is located at Charlottesville, Va. The service of the laboratory is available to farmers and lime manufacturers and to the general public throughout the country, and its work is devoted to all chemical and mechanical tests of value to the farmer. Its function includes the testing of soils, seeds, feeds, fertilizers, lime, farm products, and it engages in various other agricultural research and investigational work which it is fully equipped to perform.

The charge for lime requirement tests will be one dollar each, and the statement of each analysis of soil that is made will also include such advice as may be recommended by the laboratory expert, in connection with the further treatment of the soil for greater productivity. The printed matter of the laboratory, which will include a description of its general service, forms for making reports, tags and cartons for the shipment of soil samples, will soon be ready for distribution to lime companies for use in their sales work.

Extension of the Service of the Bureau to the Industry in a National Way

In May, 1917, the Agricultural Lime Bureau became a department of the work of the National Lime Manufacturers' Association, when Henry Angel, of the Kelley Island Lime and Transport Co., and A. H. Lauman, of the National Mortar and Supply Co., were chosen by the Association as members of the Bureau of the Executive Committee to represent the Ohio producing district. With this status, the Bureau will aim to gradually extend its service to the entire country as the sectional support of lime manufacturers can be developed.

Several Surveys Made

Surveys of the agricultural, commercial and transportation conditions of several of the prominent agricultural territories covered by the sales work of lime companies outside of the present working territory of the Bureau, have been made, and it is believed that the same character of service that is now being conducted by the Bureau can be applied in a practical way in other sections of the country.

The Bureau has thrived under its policy of thorough application to all projects which it undertakes, not to "bite off more than it can chew" but to finish every job that it starts. The result is a strong organization ready to expand its activities to new territory and to new lines of effort which are worth trying out for the extension of its object—the legitimate and progressive development of the greater use of lime in agriculture.

John H. Voorhees

JOHN H. VOORHEES, Agronomist of the Agricultural Lime Bureau, is the oldest son of the late Dr. Edward B. Voorhees, who was for many years Director of the New Jersey Agricultural Experiment Stations, Professor of Agriculture at Rutgers College, and President of the N. J. State Board of Agriculture. He was born in New Brunswick, N. J., and received the degree of Bachelor of Science from Rutgers College in 1911.

Since graduation Mr. Voorhees' experience has been very broad, embracing many lines of agricultural activities, though the major part of his work has involved studies relating to farm crops, soil and fertility.

He was for a time extension specialist in agronomy at the New Jersey Agricultural Experiment Stations and later took over the management of Franklin Farms, the large estate and diversified farm of Ex-Governor Franklin Murphy, at Mendham, New Jersey.

During this time Mr. Voorhees wrote many articles for the agricultural press, scientific journals, and revised his father's book on "Fertilizers," which has had a very large distribution, both before and after the revision.

Constructive Sales Methods

The Scattered Location of Farmers and a Lack of Organization Among Them Necessitates the Most Exhaustive Sales Methods to Increase the Use of Lime in Agriclture

By John H. Voorhees

THE LIME INDUSTRY is most bountifully supplied with raw material. Practically every state having an undulating surface has outcroppings of limestone which varies in composition from quarry to quarry.

It is the composition which determines to a large extent the use of the material. In general there are two divisions of the industry: the product of the quarry, and the product of the manufacturer. The products of each division are many and have a wide range of uses. In some cases the products of one division come into competition with the products of the other, as is the case with agricultural lime and limestone. There is justification for each product and each has its merits, its advantages and disadvantages.

The diversification of the industry as a whole has undoubtedly acted as a damper and retarded the growth of the agricultural lime and limestone business, whereas the present competition between the products and forms of products has done more to increase the sales of agricultural lime and the knowledge of soils, and of soil and plant requirements than any other factor. It has pressed the importance of quality and service upon the industry and brought to it a realization of the comprehensive knowledge of the conditions determining the use of agricultural lime.

Now Looked on as By-Product

Under the present management of the industry, agricultural lime is with most companies considered one of the minor products. Building lime, chemical lime, flux, ballast, building stone and the like hold places of initial importance. Sales of agricultural lime are incidental to sales of these products.

The war and changing economic conditions of the country and especially those surrounding the farmer will do much to bring about a realization that the agricultural trade may be expected in the next generation to lead all other branches of the industry.

Immense Quantities Will Be Required

The use of lime by the farmer today is quite insignificant when compared to his actual needs. The total production of lime products in the United States, Hawaii, and Porto Rico for the year 1915, amounted to 3,649,699 short tons of burned lime and limestone amounting in value to $35,229,866 (no tonnage figures available). Of this 653,868 tons of burned lime and 810,399 tons of limestone (equivalent to 405,199 tons burned lime) were used for agricultural purposes, including the manufacture of fertilizers. This amount spread over the 478.5 million acres of improved farm lands in the United States is but "a drop in the bucket."

Dr. H. J. Wheeler, formerly Director of the Rhode Island Experiment Station, probably the most widely recognized authority on agricultural lime in this country, touches upon this point in his discussion of the needs of nitrogenous fertilizers in an article recently published in the "Quarterly Journal of Economics." He says:

When one considers the fact that more than 200 million acres of the cultivated land in the United States are in serious need of liming, the significance of liming as a matter of national economy becomes apparent. The importance of the use of lime as a factor in nitrogen economy is further emphasized by the fact that there are hundreds of thousands of acres of land in the United States which cannot be made to produce successfully clover, alfalfa, and certain leguminous

or other nitrogen-fixing plants until they are properly limed.

The great obstacle in the way of fixing more free atmospheric nitrogen by means of Azotobacter and legumes is the difficulty of reaching every farmer whose land needs liming and of convincing him of the possibilities of profit from its use. Unfortunately, many such farmers are unable to purchase lime because of lack of resources, while their natural timidity restrains them from the venture of borrowing; and finally, if they could be brought to the point of using lime freely the railroads would be utterly unable at this time to deliver the 200 to 300 million tons of ground limestone or other forms of lime which should be used the coming spring.

It must be assumed that Dr. Wheeler has based his conclusions upon the immediate total lime requirement needed by the soils of the United States and not upon the normal demand which will exist at some very remote time when farmers learn the advisability of maintaining fertility, not with fertilizers alone, but with fertilizers and soil amendments, including primarily lime, manure, and green manures, in a regular systematic and rational manner.

Prospective Business of 22,000,000 Tons a Year

Consider for a moment what the normal demand in the states east of the Mississippi will be. There are in these states 217,619,605 acres of improved farm lands. According to the most reliable information obtainable no less than 1,000 lbs. of burned lime or its equivalent should be used on an acre once in a five-year rotation to maintain the fertility of the soil in an efficient manner, and produce crops profitably. This means an annual application of 200 lbs. to the acre on an area of over 200 million acres, which would require 21,761,960 short tons per annum, as compared with the total 1915 production of slightly over 4,000,000 tons of lime and limestone for all uses, and compared with slightly over the equivalent of 1,000,000 tons of lime used in 1915 for agricultural purposes. Hence, to meet the normal ideal consumption in the states east of the Mississippi will require five times the total production in 1915 and twenty-times the production of agricultural lime in 1915.

Prepare for An Increased Production

Assuming that the present consumption will increase to one-half of this demand, constructive measures must be taken not alone to meet the demand as it grows but to assist to create the demand in a logical and sound manner. This can be accomplished only through the development and operation of a broad-minded policy based on the most accurate knowledge of the use of agricultural lime obtainable, because the future of the industry depends upon the merits of the various products. There is room for all products of merit honestly represented.

The eyes of the world are now on the American farmer; and farming in this country more than any other industry will forge to the front. Economic and social conditions surrounding the farmer must be created which will more nearly approach those surrounding city people. He must have more capital and easier ways of securing it.

"Science is Reason, Reason is Truth." It is only by the application of science that we can arrive at absolute truth. The widest and best experience in America, in South Carolina, and in all civilized countries teaches that the use of lime, on soils needing lime, is profitable out of all proportion to the cost of the lime. The argument for lime has been proven in practical results on thousands of acres in South Carolina from the early forties of the last century to the present season. The dictum of the most highly developed scientific research in the United States and in Europe is given here.—Bulletin No. 59, South Carolina State Department of Agriculture, Commerce and Industries.

The farmer himself must have shorter hours for greater self-education and a shorter course or route to the consumer in order that productivity of the land may be maintained and returns be sufficient to permit of a higher standard of living. The income tax and price fixing followed by greater organization and unity will do much to bring about such a state of affairs, and such a condition will do much toward better farming and greater production involving a greater use of fertilizers and soil amendments.

Co-operation by Lime Industry Essential

But all must not be left to the Federal and State Governments. There must be an active co-operation on the part of the lime industry, individually and collectively. There must be active co-operation from all the people, because as George Washington so wisely said many years ago: "Agriculture is the basis of our whole social and economic structure."

Lime manufacturers must make their advertising and all publicity matter educational in nature and representative of the products offered the public. It must be based on the facts so far as they are known. In the case of the individual manufacturers, advertising must present the truth and only the truth, wholly, fully and clearly, and so far as possible be made in a manner which will not merely sell the product but render a distinct educational service.

If there is to be (and there should be) collective work along the lines of advertising and publicity on the part of the manufacturers, it must be of the most broad-minded type; it must be free of any taint of commercialism; free of any competitive spirit; it must be educational in nature based on the best agricultural information obtainable and presented with a spirit of service. Any reliable information of assistance to the farmer in making greater returns is a link in the chain toward greater sales of lime.

Constructive Sales Methods

Returning again to the individual companies. Without necessitating an immediate change of sales methods they should aim to make them constructive. Each sale should be so fair and honest that its influence may be the means of another sale. Members of the sales force from the general manager to the salesman, agent and dealer should be men thoroughly versed in agricultural science and practice. More important still, they should be men who bear a real sympathy with the tiller of the soil. There is more in a bond of sympathy, a general understanding, than in any other personal characteristic.

It has been the practice for a number of years, of certain fertilizer manufacturers to secure the services of graduates of Agricultural Colleges who were raised on farms to the exclusion of all others, because they have a common understanding, a bond of sympathy lacking in the city-bred man, which is a universally true statement regardless of the ability or opinion of the individual.

This is a constructive salesmanship. The salesman, dealer, agent or any member of a firm whose business it is to deal with the farmer through either direct or indirect touch should have these qualifications just as much as the county agricultural agent, whose duty it is to work with and for the farmer, if each sale is to be a factor in the creation of a greater demand.

Regarding further the matter of constructive salesmanship: so far as possible the trained force for the agricultural branch of the industry should have a single object—the sale of agricultural lime. Men as a rule handle one line of goods better than a dozen. Sidelines diversify the efforts of the individual whereas concentration of endeavor and study is needed in this one issue to make sales gains of a fundamental character.

Examples of this concentration of effort combined with individual sympathy and ambition may be distinctly noted by the efficient results obtained by a number of companies placing their entire energies in the manufacture and sale of agricultural lime only. During the past year such companies have been working to capacity and still have been unable to meet the demand upon them and fill their orders.

Always Has Official Assistance

The lime industry, too, is most fortunate in having agencies such as the United States Department of Agriculture and the various Colleges and Agricultural Experiment Stations of the States continuously using their efforts to study the subject of fertility involving the use of lime as a soil

amendment and constantly using every available channel to carry the information obtained to the farmer. The county agricultural agent is perhaps the greatest asset of the lime industry because he is always in touch with the farmer and constantly placing the facts before him. He is universally the exponent of the use of lime.

Should Study Station Work

The work of Experiment Station workers bears a peculiar significance to the sale of lime. He is looked to as the leader on educational matters relating to agricultural practice which makes it pertinent that manufacturers study closely the work of these men and conform their policies to the policies of these agricultural educators.

It is true, of course, that there is much variation of opinion among agricultural workers. This is a proof of their absolute freedom from commercialism and undoubtedly is very advantageous to the lime industry, because it creates a greater desire on the part of all to perfect sales methods. Yet this very feature has its danger unless manufacturers maintain an active co-operation and in no way allow their own advertising and publicity work to drag. They must uphold their end.

Co-operation Needed

The Agricultural departments of railroads, banks, manufacturers of lime spreaders and the fertilizer industry all contribute to the general work of spreading information regarding the use of lime among farmers. At the present time co-operation with these agencies is not as efficient as might be desired but each day is making a closer union and greater unity of effort will result.

Whatever the product or products of any one company, it should make its policy conform with the teachings of the workers of Experiment Stations who are looked to by farmers as their unbiased leaders. Sales should be based on the merits of the products, as regards their ability to produce net returns to the farmer, and each and every sale should carry with it a distinct service making it constructive in nature.

Expand on Sound Basis

The lime industry based on these principles of constructive salesmanship may be expected to expand tremendously on a rational and sound basis, and with its expansion will come greater production of crops and better living conditions generally.

Both Ground Limestone and Phosphate in Florida

THERE are immense deposits of lime rock in Florida, some very high-grade (98 per cent carbonates and above) and considerable amounts of soft limestone, as well as numerous beds of marl.

Ground limestone for agricultural use is prepared in all parts of the state by various manufacturers. A very considerable amount of agricultural lime is sold throughout the state, of local origin, the average price per ton is from $1 to $1.50 in car-lots f.o.b. crushers.

In addition to the limestone deposits, there are enormous deposits of phosphate of lime, probably the highest grade phosphatic material mined in America, of which the state ships under normal conditions from 3½ to 5 millions tons per annum.

Limestone is not considered as a fertilizer in Florida, but simply as an amendment to acid soils to correct acidity and to induce decomposition and free the insoluble plant foods contained in the soils.

The State Agricultural Experiment Station at Gainesville, Florida, publishes several leaflets in reference to the use of limestone on Florida soils.

Bermuda Limestone Deposits Are Inexhaustible

IT is understood that the quality of the lime made from the Bermuda limestone is very good and that the supply of limestone in the colony is practically inexhaustible, says the Scientific American. It is said to be quite soft before being exposed to the air, and is therefore easily crushed preparatory to burning.

An industry of this kind might be profitably worked in connection with shipping. If the producers of the lime owned and operated an auxiliary schooner or two, for example, they could not only transport their own product to the most available markets, but could easily obtain general cargoes for the return trips to Bermuda.

Striking Proof of the Agricultural Value of Limestone

HERE IS A VIEW which proves two points for the limestone producer: (1) Limestone makes fine roads; (2) it grows fine clover.

This is an Ohio macadam road, the shoulders of which show the result of the washing of its surface by numerous rains, and of the fine dust deposited in dry weather.

No Economic Loss!

Now we know why Ohio farmers prefer macadam roads. The dust which blows from them fertiiizes the surrounding fields. It is worth at least $3 a ton to them in the fields. There isn't any economic loss as when a brick pavement wears out. And a macadam road never wears out under ordinary farm traffic if the surface is kept smooth by constant maintenance and the use of new stone.

Good Advertisement

Such a road is the best possible advertisement for the limestone producer. It is the kind of evidence that convinces the hardest headed farmer. There is sound good judgement behind the Ohio quarrymen's espousal of the cause of the limestone macadam highway.

Ohio "Macadam Service" for vehicles and vegetation

Construction of Small Lime Kilns and Gas Producers Combined

For Testing Rock and Fuel Under Working Commercial Conditions Before Developing New Quarries or Building Large, Modern Plants

By E. Schmatolla

FIGS. 4 to 6 show a modification of the small kiln as shown in Figs. 1 to 3, p. 35, ROCK PRODUCTS, April 10, The modified form is particularly designed for magnesia lime and other materials which require a certain moderate temperature for burning, in order to avoid dead burning or overburning. In such cases it will be necessary to develop the flame and temper it before it is allowed to come in contact with the lime. The kiln and gas-producer is also designed to be used for lower grades of fuel, as for instance, lignite, peat, wood waste, etc.

The lower part **B'** of the kiln shaft **B** is shorter than that of the first design, and a separate cooling chamber **C** is arranged underneath, into which the burnt lime is drawn through the door **D** and dropped through the opening **d** which is equipped with a cover.

Course of the Air

The air for the combustion of the producer gas is drawn through the lower draw door **d'** as indicated by the arrow **j** into the chamber **C**, where it is preheated and whence it passes through ducts **a, a'** and **i** into the combustion chamber **F**. Additional air may be mixed with the developed flame at **t** in order to dilute it and bring it to a lower temperature.

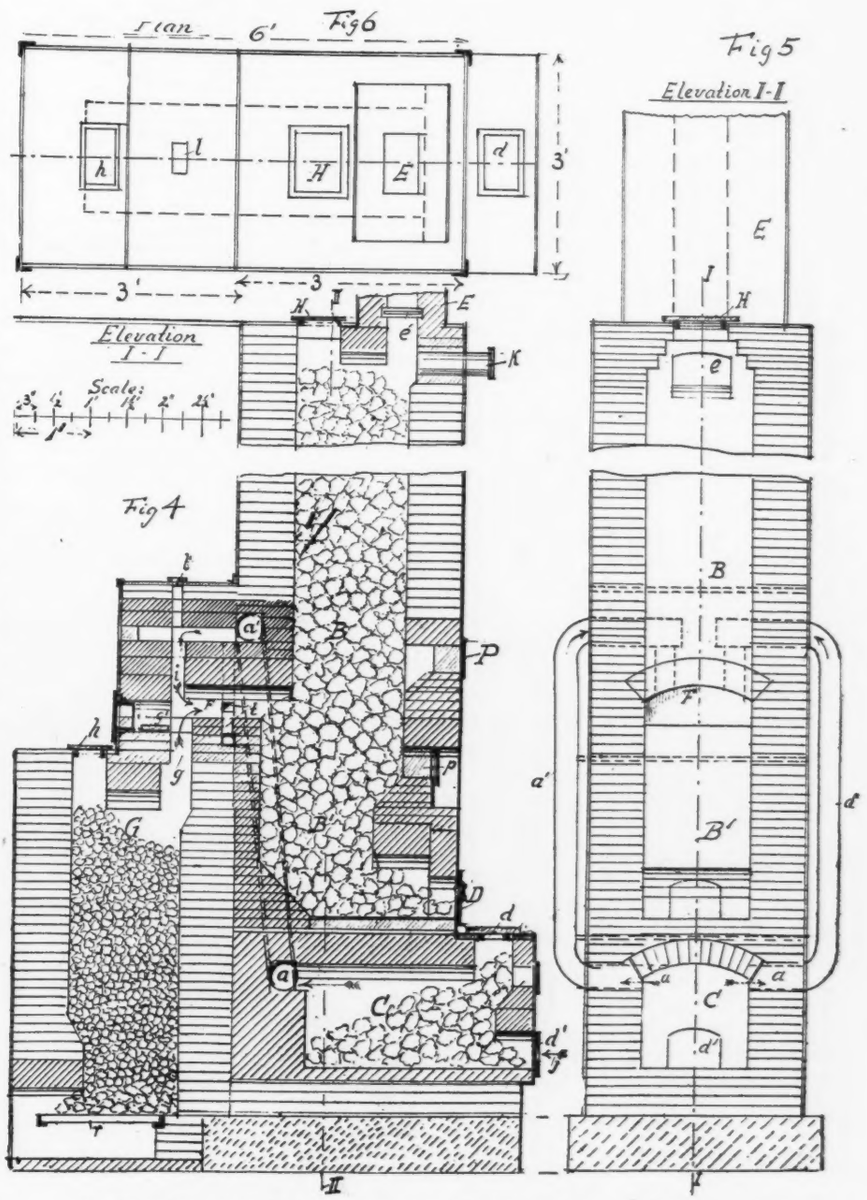
Instead of air, kiln gases may be drawn from the top of the kiln through outlet **k** and used for tempering the flame (Eldred process). Such a kiln may also be adapted for producing carbonic acid or pure kiln gases, which contain over 30 per cent carbonic acid, to be used for chemical purposes or for the manufacture of liquid carbonic acid.

Figs. 7 and 8 illustrate a modification of the design shown in Figs. 4 to 6. The idea upon which the design Fig. 7 is based is to build first a normal size gas producer **G**, which is not an expensive structure, together with the adjoining half of the lower part of a normal size kiln, including a cooling chamber **C** and a part of the burning shaft without the stone hopper.

Trying Out the Kiln

With this partially finished kiln, which may be temporarily closed by an old boiler head, or the like, the burning of the rock of a new quarry not yet burned with producer gas may be thoroughly tried out, and after satisfactory results have been obtained the entire kiln structure of a normal size kiln may be completed with all sheds, etc., belonging to it, without fear of a failure. The normal size kiln is indicated on the drawing Fig. 7 by dotted lines. Generally it will be cheaper and better to build the upper part of the kiln and the stone hopper as a steel shell and cover it with a flat top containing a feeding door, or feeding opening with a cover, and one or two exhaust pipes **E** instead of a stack.

For starting lime burning with producer gas, of course, old lime kilns may be used. The burning and cooling shaft of a gas kiln may be built into these and the old fireboxes and ashpits may be converted into small gas producers with combustion chambers.



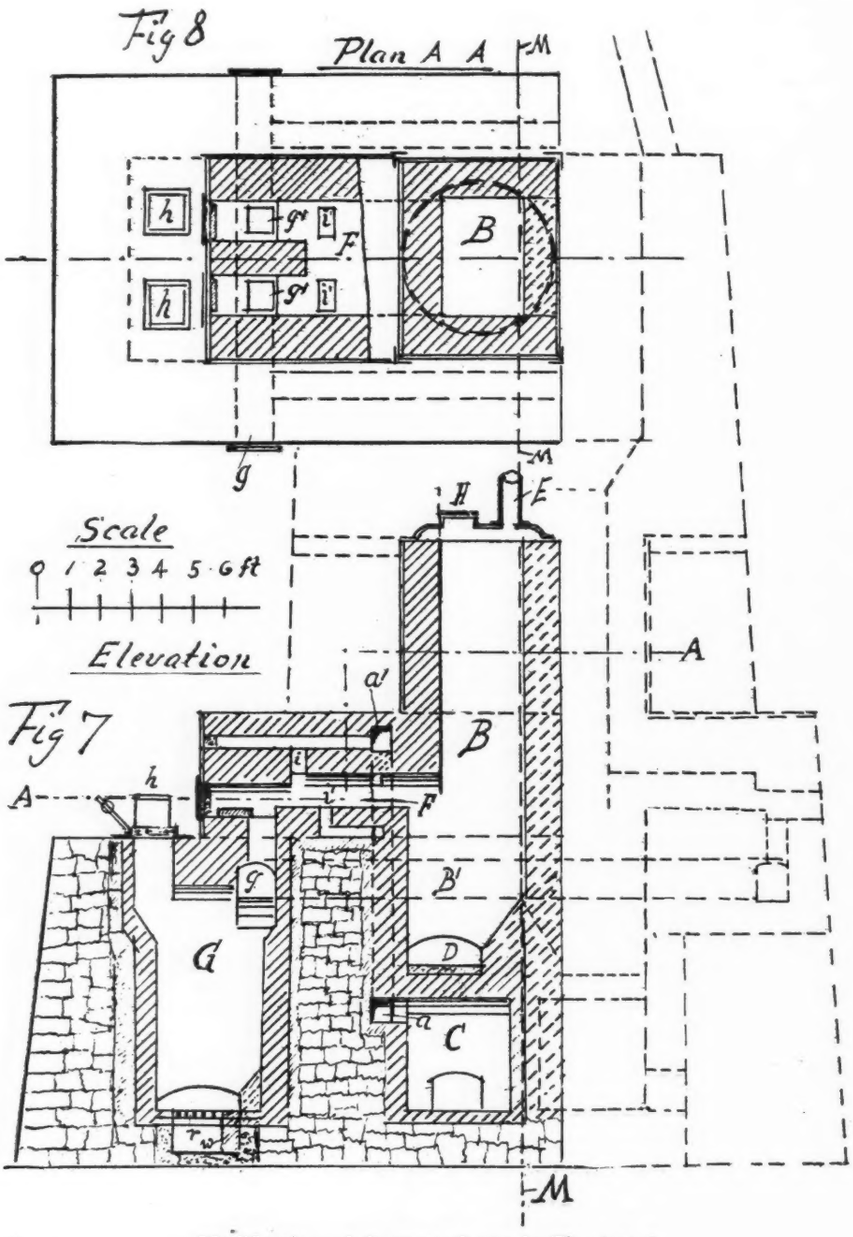
Modification of small kiln, as shown in April 10 issue of Rock Products

By building and operating a small experimental gas kiln with his own help (for instance in slack time) the manufacturer himself can acquire the necessary experience and train his own help for building and running a large plant, thereby avoiding the possibility of a failure, and saving much money in the construction and equipment of the new plant.

A small producer-gas fired lime kiln may also be built with the view of using it permanently for burning the small chips from the quarry which it is not advantageous to mix with the larger stone, as they require less time for burning and choke the draft when mixed with the large stone. They require a much smaller diameter of kiln between the fires, and the kiln can be much lower. Such a small kiln further offers the great advantage that working with induced or forced draft (which in some cases may be profitable) it can be tried out thoroughly without buying expensive machinery at the start. The writer knows very well that most of the lime manufacturers do not think much of experimenting, but the fact stands that in other industries, for instance the chemical industry, the most successful concerns own special experimental plants.

Agricultural Lime in Demand in Kentucky

LOUISVILLE, Ky.—Lime, cement and gypsum products, are in fair demand in Louisville, but there is not much really big business in sight with the exception of Government work. There has been some demand for lime for agricultural purposes, and indications are that more cement will be used than usual in monolithic type silos this summer, a lime which has been boosted by the State Department of Agriculture. There is some activity in quarry and sand operations, a good volume of street work being in evidence, a fair percentage of road work, and some building.



Modification of diagram shown in Fig. 4 to 6

U. S. Studies Health of Limestone Workers

WASHINGTON, D. C.—The United States Public Health Service has begun an investigation of the effect on the health of workers of pneumatic hammers as used in cutting limestone, it has been announced by the Treasury Department, in accordance with its plan of eliminating as far as possible preventable diseases among workers in various industries.

It has been learned by the service that inconvenience is felt by workers in this industry in using the air hammers in soft stone because of a temporary numbness of the fingers whenever the hand becomes chilled. No serious consequences resulted from this disorder, but it appeared well to find the reason of the condition and to see if it could not be remedied.

The most important cause was found to be the higher vibration rate of the hammers when used in soft stone, and the second cause, the tight and strained grasp which the workers had to use. Cold weather brought out the symptoms, but was not in itself a cause of the condition.

By using a shank of larger diameter, which would permit a more comfortable grasp by the worker, it is believed that a good deal of the strain on the muscles would be relieved. If the shank were enlarged by using a tight-fitting covering of asbestos or some similar substance, the cold would not be intensified as at present by the metal, and the handle would act as a shock absorber.

Other recommendations of a similar nature have been made by the Public Health Service to relieve the condition.

Will Develop Lime Deposits 99 Per Cent Pure

SACRAMENTO, Cal.—The El Dorado Lime and Minerals Co., recently chartered at Sacramento, will take over, develop and operate the vast lime deposits in the Shingle Springs districts that have heretofore been worked by Bloomer & Bonnefoy.

Before taking over the deposits, extensive prospecting was carried on and showed the quarries to be one of the best on the Pacific Coast. The lime therein is 99 per cent pure, and prospecting with diamond drills to a depth of over 300 feet shows the deposit goes that deep without any decrease in purity. Work has begun on grading for a railroad to the deposit.

Advertising Agricultural Lime

BELOW are several examples of booklets prepared by producers of agricultural lime. The main essential in advertising this material is to have a brand name. Agricultural lime like cement, flour, etc., is a staple. To sell a particular brand of a staple requires the use of some striking design, trademark or catchword. Having adopted an appropriate name the problem is to make it so well known to the consumer that when he thinks of agricultural lime, that name or trademark inevitably pops into his mind.

Advertising is an art and requires expert advice. Without it a great deal of money and energy is misdirected and without result. That is why one valuable feature of the Agricultural Lime and Limestone Association's work is the giving of free advice and assistance to its members in the preparation of their advertising literature. The samples below are all by manufacturers who belong to this association.

Another method of publicity members of this Association have employed is to give away a load or lime to every contestant of the Boy Corn Growers' Prize.

Lime Needed on West Coast

Producers Should Introduce Its Use by Selling at Cost of Production for Year or Two

By F. J. Sievers
Professor of Soils, State College of Washington

THERE is a very decided need of ground limestone in the western part of the State of Washington. This takes in practically all the territory west of the Cascade Mountains. There are several reasons why the farmers in that section are not taking hold of the limestone as readily as they should. One is that the original producer of the material has held up the price of the ground limestone minus the freight to such a high figure that the distance over which this material has to be shipped brings its price up so high that very few of the average farmers have been in a position where they could make the necessary investment, justifiably.

Another reason why ground limestone has not been used more generally is because a large portion of this area referred to is still very new, and consequently there is still a large amount of virgin fertility in the soils. As soon as these soils have been cropped for several years and this virgin fertility becomes somewhat exhausted, it is only a matter of a comparatively short time before lime will have to be used on these soils very generally. I have felt personally that even from the standpoint of greatest profit to the producer it might be well for him to put the material on the market for a year or more at practically what it costs to grind it in order to encourage the farmer in getting acquainted with its benefits.

Anything that ROCK PRODUCTS may do to impress upon the ground limestone producers in this state the fact that the material is too expensive for general use will have a very decided effect on the extensive use to which the material will be put, and also a very great benefit to the farming in the western part of the state.

Just a few illustrations showing how the producers are helping the farmer solve his fertilizer problems

Web War Is Weaving for U.S. Business

Government Improvement and Constructive Program Grows as War Progresses, Says Allen E. Beals to Credit Men—Great World Commerce for this Country is Certain

THE ADDRESS DELIVERED by Allen E. Beals at the annual dinner of the Credit Association of the Building Trades of New York was an optimistic review of present-day business conditions, a conservative statement of the growing prospects of the immediate future and an equally conservative but positive claim for unusual prosperity after the war, a visualization of extended commercial activity for the nation following the attainment of peace. He said:

"There are some who tell us that building construction is stagnated because the price of construction commodities is too high. There is no greater fallacy than this. Building is stagnated today because speculative construction work is not patriotic. The only speculative builder who can build without a blush today is Uncle Sam and he is asking you and your clients, not to stand aside and look on, but he is inviting you to get into the surest building speculation you ever heard of or had a part in: that of building up a barrier of invincible man power, American brain power; Yankee determination to build such a structure for the safety of human beings the world over that will not only stem the vicious onslaughts of the heinous Hun but will fill him so full of awe as to make him quake at the very imagination of ever again attempting to bring his kind of kultur into the civilized world.

Higher Prices Due—Low Prices Far Off

"While many of you were away on your vacations last August four men of the Building Material Exchange asked Borough President Marcus M. Marks if we could count upon his support in trying to reach a true analysis of the building situation. He became enthused in the idea at once, and called a conference of all building interests of the city on September 20. The result was the appointment of committees to make investigations regarding various departments of building endeavor, the mortgage, real estate, financial and labor departments.

"The report showed on October 15, that building material prices had advanced in the aggregate 62 per cent, and that there would undoubtedly be further price movements upward. On April 1, this year, the aggregate advance in the price of all basic building materials averaged 89 per cent and by the end of the half year the advance without question will be in excess of 100 per cent over levels ruling in the spring of 1914.

"And even that will not represent the top, for long after the foe has been rolled back and has been made to pay the full measure of toll for its years of frightfulness, the factors that will make or lower price in building materials will still be far off. We will still have a duty to perform in keeping the war won, and it is there that building materials will play its greatest role; for building, in the fullest, most glorious sense, means construction, and war is destruction.

Our War Is Constructive Too

"But this war as conducted by the United States is not all destruction. If it were, the building material industry would be closed down tight long before this. And right here is where the rainbow rises. Where it sinks into the horizon is the pot of gold. We must follow the shimmering arc with faith, with hope and with enthusiasm.

"Uncle Sam is going to war, not because he wanted to, but because he had to. He was worth two hundred billion dollars when the Kaiser slapped him on the cheek and told him he was afraid to fight. With a wealth like that he could afford to take forty billions of dollars out of his till, representing his petty cash, without drawing on the bank for a dollar.

"We have been in the war for a year and he has not had to ask for anything like half that amount and yet he had put an army across 3,000 miles of tumbling ocean and has built up a war machine in this country in twelve months that is ready to meet the war machine that it took the Kaiser forty years to build. Industrial establishments have expanded in size like balloons all over the land and yet he has a construction program of $800,000,000 more to come out not to mention $500,000,000 in addition for Treasury and Interior Department development.

Nation Just Beginning to Spend

"The web the war is weaving for the builder is a gigantic one, only it is along different lines than those which we have been following. I have at Washington a representative who is assured that the beginning is just in sight for the active participation of the builder and the real estate man in the war winning program.

"We are in the war, not only to win it, but to help the 25 other nations who are also at war with our enemies to get back on their feet again after peace is declared. Think of the magnitude of that task. It is the United States that must supply the world with the myriad of commodities that only Germany could supply before the war. In the first place we have got to help rebuild France. American materials will be required in terrific volume to reconstruct her factories, to equip them with machinery, to supply her with raw materials and possibly to furnish her with man power.

We Must Supply the World

"And there is splendid Great Britain, which has had to stop all non-essential industries to obtain fighters. The old methods and machinery she once used will not suffice to keep her abreast of modern economics when the war ends. This must be her market also for new machinery, equipment and raw materials. South America has been Germany's best customer, but she is already buying almost exclusively from the United States. China, that awakening giant of the Pacific, that wonderful country which has found her best friend in the United States, must be entirely modernized with American goods, and American building materials are going across a continent and an ocean even now in exchange for hemp for rope for our vast new fleet of boats.

Liberty Loan Money Is Saved Money

"And while all this is going on, America itself has caught up with her rentable space, even with a tenth of her population in uniform of one sort or another, and must immediately give ear to construction, equipment, machines and motive power. Is there any banking institution that will give a deaf ear to this gigantic appeal for industrial funds? Is there any one who cannot see the potentiality of this war as symbolized in a web that is being weaved for builders? Perhaps some one will cite the money placed in Liberty loans, but who will say that money has been spent? That money has been saved. It is here and is being expended right among us now. It is earning more money and when money is saved and is producing more money is not that the very time that building prosperity exists?

"We have our building depressions when the populace cannot save money. With carpenters receiving $90 and $100 a week and plasterers $7 a day, which is the latest demand they have made, money can be and is being saved. No day like this has marked our calendar. The omen is auspicious.

Returned Soldiers Will Be Efficient

"The dubious point out the labor problem as a woeful one. I cannot view it in

that light. I like to look beyond the ocean and the blood-stained fields and see the glorious standard of the U. S. A., that emblem of the free, enfolding people who ought to be, and by the Grace of God and the power of our mighty men, will be made free; come floating down the peaceful quays of France toward home. And as these ribboned symbols of the greatest land on earth swing up the avenue echoing the tear torn cheers of millions who have prayed that other millions might come safely home to them, I like to think those are not the slouchy, carefree artisans and clerks that went away, but men returning from the completion of the biggest job the world has ever known.

They Will Oversee

"Think you those men will be the kind who knew no goal but the easiest way to earn a dollar bill? They'll be a different kind. They'll want the wage, perhaps the highest wage you've ever paid, but they'll be worth each dollar that they earn and put to shame the labor profiteer. They'll be the men to oversee and superintend, schooled in the strictest school of all, an army camp. Their efficiency will register for the shortage of men because they will be imbued with the fact that the fight they've fought is but half won unless they help inspire those at home with the keen delight of doing things the modern way.

Soldier Trained Will Oversee

"Will you, employers, measure up to the taskmaster standards they have had? They'll see a difference in the way you handle men and noting the deficiency will seek to start in business for themselves and in the competition, giving preference to the employees accustomed to military usages, no doubt will prove worthy competitors. The times demand industrial preparedness, not in machinery, nor in the man in overalls, but at the head in generalship.

"The web the war is weaving for builders is being spun right now."

Agricultural Lime Men Meet at Columbus, Ohio

Gather Under Auspices of Agricultural Lime and Limestone Association to Discuss Ways and Means of Promoting Sales

IN ANSWER to a call issued by G. J. Wilder, manager of the Agricultural Lime and Limestone Association's bureau at Columbus, Ohio, about a score of manufacturers of agricultural limestone met in Columbus, May 1, to discuss ways and means of expanding the business. The meeting was productive of a better understanding of some of the problems of the industry and emphasized the need of closer co-operation. The only positive results accomplished at this meeting, however, were the determination to keep the Association alive, and to appoint a committee of five which will meet soon in Cleveland, Ohio, to devise some scheme for expanding the Association and continuing its good work.

Sales Methods Discussed

J. C. King, of the Carbon Limestone Co., Youngstown, Ohio, summarized sales experience in Pennsylvania, where a large share of the business is done through dealers and in bagged material. He said the farmers were demanding the fine ground material (70-90 per cent through a 100-mesh) and were willing to pay the difference in cost. He made it clear that it is much easier to promote and sell the fine-ground product than the coarser material.

H. S. Butler, of Mumm-Romer Co., Columbus, Ohio, an advertising expert, gave some very valuable suggestions on a proposed advertising campaign. He said that the advertising of agricultural lime and limestone up to this time, while valuable in an educational way, had reached only the first of the three steps necessary for a successful issue. That step was creating interest; the other steps are (2) the creation of a desire to buy and (3) the decision to buy. Mr. Butler's paper will be published in a subsequent issue of ROCK PRODUCTS.

Prof. F. E. Bear, of Ohio State University, took the farmers' point of view and refused to admit that there were better results from fine grinding, or that the additional expense involved was justified. In regard to advertising literature, he admitted the welcomeness of this to his work, and he suggested that instead of giving chief prominence to the use of lime, the principal feature be made the method of crop growing. Thus a booklet devoted to "Clover Crops," mentioning incidentally the part lime plays, would be of more value as advertising, he said, than a booklet on "Liming Soils for Clover."

Split on Fineness of Grinding

The general sentiment of the meeting seemed to be that advertising could best be done through the use of a standard brand or trade-mark. This would require that all members of the association come up to a certain standard of product—a certain standard fineness of product. On this there was a wide divergence of opinion, and it was not possible to unite those attending the meeting on any such standard.

In Eastern Ohio and in all the Eastern States the practice is everywhere toward a finely pulverized material, while the majority of Central West producers favor a material of a coarser type, and consequently a type cheaper to produce. The relative effectiveness of the two or more grades of material is a matter of scientific debate, but the general consensus of opinion is that the finer ground the material is, the quicker the results—and from the selling standpoint quick results are admittedly a great advantage.

Motor Truck for Deliveries

A most interesting discussion followed a paper by Perry Fay, of the White Motor Truck Co., Cleveland, Ohio, on the successful handling of bulk freight by motor trucks. The low price of the commodity and exceptionally favorable freight rates prohibit long-haul motor truck competition with the railways, unless some scheme is devised to make the return trip productive in revenue. For short hauls of from 3 to 10 miles from the plant the motor truck is already being quite widely used for agricultural limestone deliveries.

Committee on Organization Appointed

The following committee was named to work out a more comprehensive scheme of development: Chairman, F. R. Kanengeiser, Bessemer Limestone Co., Youngstown, Ohio; Henry Angel, Kelley Island Lime & Transport Co., Cleveland, Ohio; Wm. H. Hoagland, Marble Cliff Quarries Co., Columbus, Ohio; J. C. King, Carbon Limestone Co., Youngstown, Ohio; H. E. Bair, The France Stone Co., Toledo, Ohio.

Producers Registered at Meeting

Miss M. B. Miller, Ohio Marble Co.....Piqua, Ohio
A. A. Hall, Ohio Marble Co....Piqua, Ohio
Wm. H. Hoagland, Marble Cliff Quarries Co.....Columbus, Ohio
F. J. Colgan, Marble Cliff Quarries Co.....Columbus, Ohio
Wm. Margraff, Marble Cliff Quarries Co.....Columbus, Ohio
F. R. Kanengeiser, Bessemer Limestone Co.....Youngstown, Ohio
Clyde Calvin, Bessemer Limestone Co.....Youngstown, Ohio
Henry Angel, Kelley Island Lime & Transport Co.....Cleveland, Ohio
H. V. Briggle, O. C. Barber Allied Industries Co.....Canton, Ohio
J. W. Wirth, Agricultural & Commercial Lime Co.....Canton, Ohio
R. F. Lynn, France Stone Co.....Toledo, Ohio
H. E. Bair, France Stone Co.....Toledo, Ohio
J. C. King, Carbon Limestone Co.....Youngstown, Ohio
Morton R. Grinnell ..Yellow Springs, Ohio
O. L. Smith, Cedarville Lime Co.....Cedarville, Ohio
R. J. Fuller, Columbia Products Co.....Cleveland, Ohio
Chas. C. Ward, Michigan Limestone & Chemical Co.....Buffalo, N. Y.
Prof. Firman E. Bear, Ohio State University.....Columbus, Ohio
G. J. Wilder, Manager of the Agricultural Lime and Limestone Association.....Columbus, Ohio
Fred Witmer, Ohio Hydrate & Supply Co.....Woodville, Ohio

U. S. May Refund Part of Penalty Income Tax

WASHINGTON, D. C.—Under the terms of a bill introduced by Senator Frelinghuysen, of New Jersey, any person, corporation, joint stock company or association subject to the income tax, who or which has been or may be compelled to pay or become liable for any additional tax imposed for a neglect to file a return before March 1 of any year, may, within one year after the passage of this bill, make application to the Commissioner of Internal Revenue for a refund of such additional tax.

Whenever it appears to the satisfaction of the Commissioner that the additional tax was assessed or imposed solely because of a neglect to make a return at the time specified and without any intention or design to hinder or delay the United States in the collection of the tax originally assessed, he may pay back to the tax paying person or enterprise all such additional taxes in excess of $100 for any single year.

The bill was introduced to relieve the thousands of persons and firms who have been penalized for innocent failure to make returns by the date specified. In such cases an additional tax of fifty per cent of the original tax is added as penalty.

Cement and Gravel Stocks in New York.

NEW YORK—Expectation of the construction of 3,000 homes by the Civic League with government aid in and about New York to house ship yard workers, prompted the building industries of this city to make a survey of the building material market.

Stocks on hand of Portland cement throughout the country on Feb. 1, 1918, were only 63 per cent of what they were in February, 1917. The cost of production in 1917 a barrel, in the two Eastern zones, was about $1, while today the price is almost $2. The increasing cost of cooperage in cotton bags will force this price up to $2.25 during the summer.

The quantity of gravel on hand in New York is about 2,000,000 yards, less 500,000 yards taken out of the market by the Government. Of the 1,500,000 remaining, about 900,000 are under contract. Sand is scarce in New York.

Building Material Men to Meet in Chicago

SECRETARIES of building material associations of the United States will meet at the Hotel Sherman, Chicago, May 23, at 10 a. m., at the call of George A. Olson of the Chicago Building Material Exchange, for the purpose of organizing the building material interests of the nation with a view to aiding the Government to win the war. This will be the first of a series of quarterly conferences.

Wholesale Prices of Sand and Gravel

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine sand, 1/10 inch down	Sand, ¼ inch and less	Gravel, ½ inch and less	Gravel, 1 inch and less	Gravel, 1½ inch and less	Gravel, 2 inch and less
EASTERN:						
Allentown, Pa.	1.25@1.35		Concrete gravel, 1.25			
Buffalo, N.Y. (Niagara River)	.80	.75	.70	.70	.70	.70
Philadelphia, Pa.		.85@ .95		1.15	1.00	
CENTRAL:						
Algonquin, Ill.		.50	.50	.50	.50	
Barton, Wis.	.75	.70	1.00	.70	70	.70
Chicago	.93@1.03	.83@ .93	1.00@1.20	.83@ .93	.83@ .93	.83@ .93
Chicago, Ill.			.83 to .93, all sizes.			
Chicago switching district	Lake 1.37½*	Torpedo 1.25*	¼" 2.50*	1.25*		1.25*
	Bank 1.05*		⅜" 1.50*			
		Bank and lake sand, cu. yd. 2500 lbs.			Bal., 3000 lbs.	
Cincinnati, Ohio	1.10	1.05*		1.05		1.05
		F. O. B. track at point of delivery.				
Des Moines, Iowa	.40@ .75	.50	1.25@1.50	1.25@1.	1.00@1.25	1.00@1.25
Elgin, Ill.		.50	.50	.50	.50	.50
Escanaba, Mich.	1.15*	Roof 1.50	1.10			
Ft. Dodge, Iowa	.80	.70	1.35			1.35
Hawarden, Cherokee and Doon, Iowa	.40@ .60	.40@ .60		.90@1.10		.85@1.00
Indianapolis, Ind.	.50	.50		.65	.65	.65
			Concrete mix, .55.			
Indianapolis, Ind.	.67½*	.67½*	1.00*	1.00*	.81*	.81*
Joplin, Webb City, Carthage, Mo.	.85	.50	¶			
Janesville, Wis.	.50	.50			.50	
Mason City, Ia.	.50@ .60	.40@ .50	1.00@1.20	1.00@1.20	.90@1.20	.90@1.20
			Railroad ballast and road gravel .40@.50			
Milwaukee, Wis.		.90	.90	.90	.90	.90
Ottawa, Yorkville and Oregon, Ill.	.50@ .60	.50@ .60	.75	.60@ .75	.60@ .75	.60
Randolph, Minn.	.50		2.00	1.25	1.05	1.05
Rockford, Wis.	.55@ .60	.55@ .60			.60@ .70	
Sabula, Ia.		.55	1.25			
Saginaw and Bay City, Mich. (vicinity)	.35	.35	1.25	1.10	1.10	1.00
	Add .44 to .50 ton frt. to Saginaw and Bay City.					
South Bend, Ind.	.40	.40@ .50	.60@ .70	.50@ .60	.50@ .60	.50@ .60
St. Paul, Minn.	.60@ .80*	.60@ .80*	1.80@2.00*	1.15@1.35*	1.15@1.35*	1.05@1.25*
			Roof			
Terre Haute and Wabash Valley District	.75	.75	1.25 .75	.75	.75@ .80	.75@ .80
Montezuma, Covington, Ind.			.75 for all sizes.			
Winona, Minn.		.60@ .90	1.00@1.40	1.00@1.40	.95@1.25	.95@1.25
SOUTHERN:						
Lake Weir, Fla.	.50					
New Orleans, La.	.75*	.75*	1.35*	1.35*	1.35*	1.35*
Pelzer, S. C.			All sizes, .55, washed but not graded.			
WESTERN:						
Denver, Colo.		.50*				
Kansas City, Mo.			Missouri River sand, .75 yd.; Kaw River, 1.10.			
Lincoln, Neb. (carloads)	.52	.52	1.80	1.80		1.80
Lincoln, Neb. (wagon lots)	1.00@1.20	1.00@1.20	2.60	2.60		2.60
Pueblo, Colo.		.50@ .80	.60		1.00@1.50	
Seattle, Wash.	1.00	1.00	1.75	1.00		1.00
Vancouver, B. C.		1.00*	1.25*	1.00*		1.00*

Bank Run Sand and Gravel

City or shipping point	Fine sand, 1/10 inch down	Sand, ¼ inch and less	Gravel, ½ inch and less	Gravel, 1 inch and less	Gravel, 1½ inch and less	Gravel, 2 inch and less
EASTERN:						
Attica, N. Y.	.50	.50	.50	.60	.60	.60
Portland, Me.			$1.50* cu. yd.			
CENTRAL:						
Barton, Wis.	40					
Escanaba, Mich.			1.00 cu. yd. 3-inch and less			
Ottawa, Oregon and Yorkville, Ill.	.45	.50				.60
Sabula, Ia.		.55				
Des Moines, Ia.	1/10" sand, 30% gr., .60 ¼" sand, 50% gr., .75, all washed					
Indianapolis, Ind.	.67½*					
Janesville, Wis.					.50	
Minneapolis, Minn.	.40@ .50	.40@ .50	1.10@1.50	1.10@1.25	1.10@1.25	1.00@1.10
			2800 lbs., 2600 lbs., 2600 lbs., 2600 lbs., 2600 lbs.			
Portsmouth, Ohio		.65		.85		
Saginaw & Bay City, Mich. (vinicity)	.50*	.50*	.75*	.75*		
	Add .44 to .50 ton frt. to Saginaw and Bay City.					
South Bend, Ind.	.25@ .35					
Terre Haute, Montezuma & Covington, Ind.	.50	.50				.60
Wabash Valley District	.75					
Winona, Minn.			Pit run gravel under 2-in., .60@.90.			
SOUTHERN:						
Calaveras, Texas		.40@ .50				
Howcott, La.			Running 50% plus on rock content on ⅛" screen, .55@.65			
Knoxville, Tenn.	.85	.85				
WESTERN:						
Denver, Colo.			.30*			
Pueblo, Colo.			River run unscreened, .60.			

*Cubic yard.

¶ .25 millrun; screened .50

House Has Bill to Keep War Roads Repaired

WASHINGTON, D. C.—Carrying an appropriation of $20,000,000 for the work, a bill has been introduced into the House of Representatives by Congressman Zihlman, of Maryland, to provide further for the national security and defense and to assist in the prosecution of the war, by keeping state highways in good repair through the assistance of the Government.

Representative Zihlman declared that many permanently improved highways of concrete, macadam and other modern construction are, because of the existence of a state of war, being subjected to such extraordinary use by heavy vehicles, army trucks and vans, operated by or in the interest of the United States, as must involve their deterioration and destruction.

The measure provides that state highway or road commissions may petition the Secretary of War to declare certain highways military roads, and they shall be so designated for the duration of the war, and during such period of extraordinary use of such roads, by and in the interest of the Federal Government for a reasonable time after the war, the Government is to contribute in suitable instalments in each year its proportion of the funds necessary for the maintenance of such highways, but such contributions are not to be more than two-thirds of the sum so necessary, or more than $1,000 per mile per annum, and such contributions may not be used for any purpose except the repair and maintenance of such military roads and only such roads as are of concrete or other modern permanent construction. The appropriation of $20,000,000 provided for in the bill, is to be so expended during the fiscal year ending June 30, 1919.

Illinois Decides to Improve Only Federal Aid Roads

SHORTAGE of men and material and the need to use all resources in prosecuting the war are the reasons given by the Illinois Department of Public Works and Buildings for the statement that no new contracts for state roads will be awarded this year. All county boards and highway officials are being informed. The action followed a conference between Gov. Lowden and highway officials.

Federal aid roads, used in transporting war material, food, and fuel, will be improved, however, and the expenditure of $4,250,000 in improving these roads is contemplated.

Who Needs Coal?

Many mines in bituminous coal districts are shut down in spite of probability that next winter's coal supply will be short. Notwithstanding unprecedented wages received during past year, miners in these districts are reported on verge of starvation.

Wholesale Prices of Crushed Stone

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Crushed Limestone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN POINTS:						
Auburn, N. Y.	.60	1.00	1.00	1.00	1.00	1.00
Buffalo, N. Y.	All sizes 1.00 net per ton except R. R. ballast					
North LeRoy and Akron, N. Y.	1.00 all sizes including R. R. ballast					
Syracuse, N. Y.	.60	1.00	1.00	1.00	1.00	1.00
Snowflake, W. Va.	1.00	1.00@1.25	1.25	1.25	1.00	.90*‖
CENTRAL:						
Allen County, Ohio	.85 to 1.15 per cu. yd., all sizes					
Belvidere, Ill.	1.00 per ton, all sizes or quantity					
Davenport, Iowa	1.00@1.15	1.25*	1.25*	1.15*@1.25*		
(Quarries near Davenport)	Dust .50	1.15@1.35	1.10@1.25	1.00@1.10	.95@1.00	.90@1.00
East St. Louis (vicinity)	1.50†	.90@1.10	1.00@1.10	1.00@1.10	1.00@1.10	1.00@1.10
		(Railroad ballast considerably cheaper)				
Eden and Knowles, Wis.	.80	.80	1.00	1.00	1.00	1.00
Illinois, Southern	1.25	1.25	1.25	1.25	1.25	1.10
Lannon, Wis.	.90@1.00	1.00@1.05	1.00@1.05	1.00	1.00	1.00
Lewisburg, Ohio	.50@ .75		.80@1.00	.80@1.00	.80@1.00	.80@1.00
Mt. Pleasant, Iowa	1.50		1.10	1.10	1.00	
	Rip Rap .85 cu. yd., 2240 lbs. Rubble, 1.00 cu. yd.					
Cleveland, Ohio	Avg. price, all sizes f.o.b. cars 1.70 net, ton					
Cincinnati, Ohio	Avg. price, all sizes f.o.b. cars 1.32 net, ton					
Columbus, Ohio	Avg. price, all sizes f.o.b. cars 1.22 net, ton					
Detroit, Mich.	Avg. price, all sizes f.o.b. cars 1.22 net, ton					
Ft. Wayne, Ind.	Avg. price, all sizes f.o.b. cars 1.27 net, ton					
Joplin, Webb City, Carthage Mo.				1.25@1.50	2.00	
Mankato, Minn.				1.00	.80	
Muncie, Ind.	.90 to 1.00 ton, all sizes					
St. Louis, Mo.	1.20@1.70†	1.20	1.20	1.20	1.20@1.65§	.75‖
Toledo, Ohio	Avg. price, all sizes f.o.b. cars 1.42 net, ton					
SOUTHERN:						
Brooksville, Fla.				2.15		
El Paso, Texas	.95	.95	.95	.95	.95	
Irvington, Ky.	.50			.65	.65	
Stephensburg, Ky.	1.00 per ton, f.o.b. cars					
WESTERN:						
Kansas City, Mo.	.30	1.05	1.05	1.05	1.05	1.05
Blue Sprgs. & Wymore, Neb.	.15	1.25	1.25	1.15	1.05	1.00
CANADA:						
Dundas, Ont.	.50@ .85§	.85§@1.05	.85§@1.05	.85§@1.05	.70§@ .85	.70§@ .85
Hull, Quebec	1.25	1.90	2.00	1.75	1.50	1.25

Crushed Trap Rock

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Baltimore, Md.—Trap	1.90@2.25	.....	.....	1.75@2.00	.....	.....
Duluth, Minn.—Trap	.65@ .75	1.25@1.35	1.25@1.35	1.15@1.25	1.15@1.25	1.15@1.25
Richmond City, Calif.—Trap	.65*	.....	1.20*	1.10*	1.00*	.....
Glen Mills and Rock Hill, Pa.	1.05	1.35	1.55	1.55	1.60	1.30‖
Dresser Junction, Wis.	.50	1.25	1.25	1.00	.90	.....
New Haven, Conn. (vicinity)	.80	1.30	1.25	1.20	1.10	.....
Oakland, Calif.—Trap	1.50 for all sizes					
Paterson & Millington, N. J.	1.60	1.75	1.75	1.60	1.40	.....
Philadelphia, Pa. (vicinity)	1.25	1.75	1.50	1.25	1.25	1.25
Westfield, Mass.	.60	1.00	1.10	1.00	.90	Not made

‖R. R. ballast.

Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Little Falls, N. Y.—Syenite	.60	Other sizes 1.00, including R. R. ballast				
Hendlers, Pa.—Quartzite	.75	1.00	1.35	1.00	1.00	1.00‖
Boulder, Col.—Sandstone	.....	.....	.....	2.00*	.....	1.75*
Mt. Pleasant, Ia.—Basalt	.....	.....	.....	.....	.95	.85‡
Atlanta, Ga.—Granite	.35	1.75	1.60	1.50	1.50	1.45
Baltimore, Md.—Granite	1.90@2.25	.....	.....	1.75@2.00	.....	1.75
Richmond, Va.—Granite	.80@1.00	1.50@1.75	1.50@1.75	1.50@1.75	1.50@1.75	1.50@1.75

*Cubic yard. †Agri. lime. ‖R. R. ballast. §Flux. ‡Rip Rap.

Motorized Freight Lines

LOUISVILLE, Ky.—That motor trucks will be used to a steadily increasing extent for transporting freights formerly handled by rail, was the sense of a recent meeting of the Louisville Engineers & Architects Club, which was given over to discussion of roads.

One On the Editor

A FEATURE of ROCK PRODUCTS has always been the publication of new incorporations in the field of rock products manufacture. Every effort is made to have these accurate. Here's one that got by in our issue of Feb. 27:

Montgomery Buffalo Rock Co., Montgomery, Ala.; capitalization, $10,000; incorporators are S. W. Lee, B. G. McCormack, H. S. Badham and E. B. Steele.

Inquiry as to the nature of the business to be transacted elicited the following reply: "Carefully scan our letterhead, this answers all your questions." The letterhead reads thus:

Can you beat it?

NEW MACHINERY AND EQUIPMENT

Inclosed Conveyor Type of Limestone Dryer

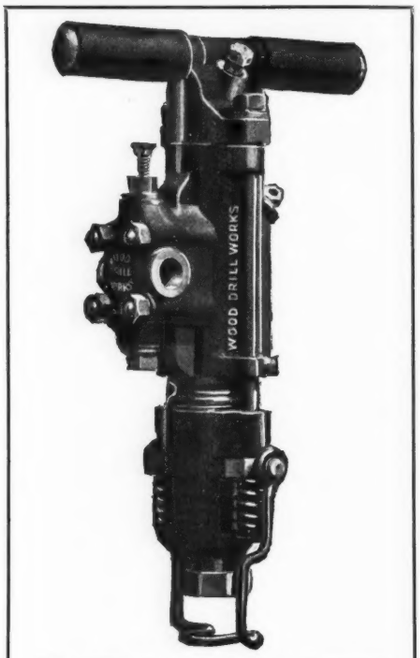
AN unusual type of dryer has been used quite successfully by the Kellam & Shaffer Co., plaster manufacturers, Schenectady, N. Y. It is the invention of M. T. Cass of this company and is patented. It is used for drying sand. The inventor claims it might be used successfully for drying limestone.

The wet material is run in at the top of the oven (see accompanying sketch) by means of an elevator which is not shown. It is moved along steel sheets by angle irons attached to a sprocket chain. When the material arrives at the end of the steel table or sheet, it drops to the next below and is carried on to the end of that sheet or table. This operation is repeated until it drops off the last sheet, where it flows by gravity to the outlet, and is picked up by an elevator and carried to bins.

Mr. Cass gives its advantages and limitations as follows:

"It does not use any more coke in ten hours than the steam dryer used in 24 hours and produces from 4 to 6 times as much sand, and we do not have to operate it continually.

"It could probably be used for drying gravel or crushed stone, but I do not think it would work as well as it will in drying sand. Occasionally pieces of crushed stone might get carried over on to sprocket wheels and perhaps cause trouble. It would be as great a success in drying pulverized agricultural lime, as it has been in drying sand."



The Wood self-rotating hammer drill

Self-Rotating Hammer Drill

A NEW self-rotating hammer drill has been placed on the market by the Wood Drill Works, Paterson, N. J.

Some of the special features claimed for it are: Automatic lubrication; balanced valve that travels only $\frac{3}{16}$ in. each way from center, giving long wear; drill hole automatically cleaned by pressure on the up-stroke of the piston; by pressing down the button on the top of the chest, full pressure is applied to the bottom of hole through steel blowing out cuttings.

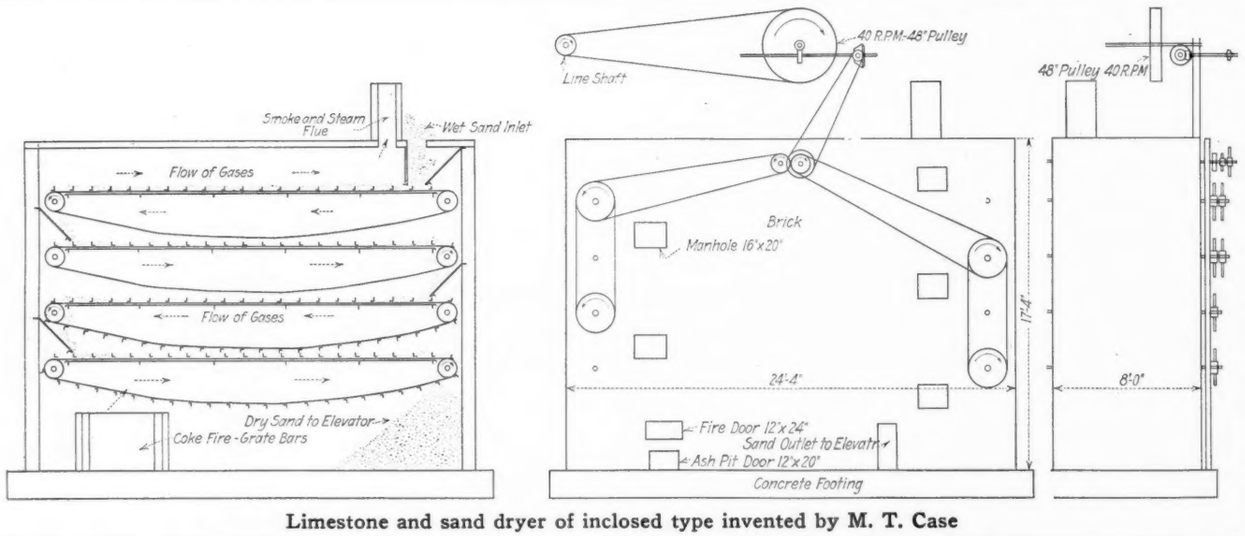
The dimensions are: Length over-all, 20 in.; stroke, 2 in.; diameter of cylinder, 2¼ in.; size of steel used, 1 or ⅞ in. hexagonal hollow; size of air hose, ½ in.; size of steam hose, ¾ in.; weight, 47 lbs.

Cummer Limestone Dryer

SEVERAL producers of agricultural limestone have installed dryers of the Cummer type. One of these installations at the Marble Cliff Quarries Co., Columbus, Ohio, is shown on p. 21 of this issue. This dryer is made in six sizes with capacities from 5 to 40 tons of limestone per hour.

The cylinder, or drum, is fitted on the inside with a number of cascading shelves which carry the limestone to the top of the drum and drop it. The cylinder is also provided with a large number of heat inlet holes, which are covered on the inside with an elbow-shaped casting, which prevents the limestone dropping out of the cylinder, but permits the direct heat from the furnace to enter the cylinder in direct contact with the limestone. By this application of the heat, it is claimed that much more heat is used in a given size cylinder, and much better efficiency is obtained than by the plain cylinder without the heat inlet openings.

The temperature is regulated to suit the moisture in the stone. All Cummer type dryers which use coal for fuel are provided with a mechanical stoker and a special furnace which will burn slack bituminous coal.



Limestone and sand dryer of inclosed type invented by M. T. Case

Passed By The Screens

Personals

Grover E. Bear has resigned from the highway department of Allentown, Pa., to enter the employ of the Fuller Engineering Co.

J. E. McNichols, formerly of the Producers' Material Co., and his son, Frank McNichols, formerly of the Wisconsin Granite Co., both of Chicago, are at Charleston, W. Va., on a government contract.

J. W. Megown has withdrawn from the George N. Connell Co., Lexington, Ky., successors to the Connell-Megown Co., to devote his entire time to the quarry operations of the English Stone Co., at Ida May, Ky.

Henry G. Shirley has resigned as chief engineer of the Maryland State Roads Commission. Mr. Shirley has held the position since the resignation of Col. W. W. Crosby in May, 1912, and was formerly roads engineer of Baltimore county.

R. T. Durrett, president of the Kentucky Lithographic Stone Co., with plant at Brandenburg, Ky., has enlisted in the Engineering Corps. Due to his absence the company has closed the Louisville office and store, and in the future will conduct all operations from the Brandenburg plant.

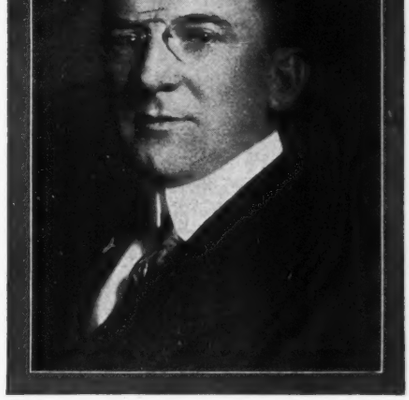
Howard P. Withington is the new Southern sales manager of the Sturtevant Mill Co., and has opened an office in the Healey Bldg., Atlanta, Ga. He has had many years experience at the Sturtevant plant, and is thoroughly acquainted with the machinery and product of the corporation.

W. H. Hoagland, president of the Marble Cliff Quarries Co., Columbus, Ohio, has been elected a member of the executive committee of the Manufacturers' War Industries Bureau of the Columbus Chamber of Commerce. The purposes of this new organization are "to assist the Government in the prosecution of the war and to advance the mutual interests of the manufacturers of Columbus."

R. W. Sherer, secretary of the Wisconsin Crushed Stone Association, was a Chicago visitor during the week of April 22nd. Mr. Sherer states that the solution for one of the big problems of the quarry man lies in the correct handling of the storage pile. "If quarries would store stone at times when they are operating and there is no demand, they would have an ample supply to take care of demands when the quarries are not operating," says Mr. Sherer.

E. L. Sparks, lately industrial editor of Engineering News-Record, has been appointed New England representative of the Ball Engine Co., manufacturer of Erie Revolving Shovels. Mr. Sparks is a graduate of the Central Manual Training School of Philadelphia. His first construction experience was with the M., K. & T. in 1902, on the Oklahoma City extension. In 1904 he joined the engineering staff of the Southern Pacific Railway, for which he did a great deal of pioneer work in New Mexico and Mexico. He was appointed Assistant Engineer of Maintenance-of-Way of the Tucson Division in 1906. A year later he joined the construction forces of the Chicago, Milwaukee & St. Paul Railway in Montana as Resident Engineer. He rejoined the Southern Pacific in 1909 and became Locating Engineer of a new line across the Navajo Reservation, and construction engineer for the reconstruction of the Twin Buttes Railway. Mr. Sparks came east in 1914 and joined the staff of Engineering Record as a writer of advertising for construction equipment. He remained with the paper after its consolidation with Engineering News, and was appointed Industrial Editor of Engineering News-Record in 1917.

Charles Philip Coleman, vice president of the Worthington Pump & Machinery Corporation since May, 1916, was recently elected president. He brings to that position the advantages of his many years of experience in the industrial and mechanical field. Prior to May, 1916, he was receiver of the International Steam Pump Co. and Associate Companies, which have now been reorganized into the present Worthington Corporation. Mr. Coleman was born in Baltimore, both branches of his family dating back to Colonial times. His education was obtained at the Virginia Military Institute, the Shenandoah Valley Academy at Winchester, and at Lehigh University, from which he graduated with the degree of M. E. He entered the employ of the Lehigh Valley Railroad Co. and continued with that company in the various positions of car agent, chemist, engineer of tests, assistant to general superintendent and general storekeeper, until 1903. After two years with the Bethlehem Steel Co. as purchasing agent and assistant to the president, he returned to the Lehigh as general purchasing agent. The Singer Sewing Machine Co. made Mr. Coleman its secretary and treasurer in 1903, and during his incumbency of that position he had charge of the construction of the Singer Building. After leaving the Singer company Mr. Coleman became



Charles Philip Coleman

president of the Saurer Motor Co. and afterward of the International Motor Co. He came to the International Steam Pump Co. in 1913 as vice president, and upon the outbreak of the war in 1914 was made one of the co-receivers of the company. Mr. Coleman became sole receiver of the company in 1915, due to resignation of the other receiver, Grayson Murphy, and handled its affairs until reorganization in 1916 and in so satisfactory a manner as to secure the warm commendation of the United States court. Mr. Coleman is married and has two sons. His wife was Miss Helen Douglas Rulison, a daughter of the Rt. Rev. Nelson S. Rulison, Episcopal Bishop of Central Pennsylvania. The sons are both serving in the U. S. Army at present, one as captain, Third U. S. Field Artillery, and the other as lieutenant, Aviation Section of Signal Corps.

Potash

A cargo of potash valued at more than $1,000,000 was seized by the Kings county sheriff of New York state as it was about to be unloaded at the pier from the Russian steamship Irtysh. The attachment was issued by the supreme court on complaint of Herman & Herman, Inc., chemical manufacturers of Manhattan. The cargo is the property of the Central War Industrial Committee of Russia. The complainants allege damages amounting to $190,839 on an alleged breach of contract. The cargo had just arrived from Russia for distribution to various chemical concerns. There are 2,924,275 lbs. of potash aboard the vessel, valued at $1,169,710.

Sand and Gravel

The Sidley Silica Sand Co., Philadelphia, has increased its capital $20,000 to $40,000.

Van Etten Brothers are buying sand and gravel on government orders for the Western Steel Car & Foundry Co. at Hegeswich, Ill.

The Nassau Sand & Gravel Co., 17 South street, New York, has increased its capital from $10,000 to $200,000.

Structures for the storage of sand will be built by the De Frain Sand Company at Berks and Beach streets at a cost of several thousand dollars.

A news item says that the invention of a machine to grind sea sand, which is too smooth to be of use in its raw state, has enabled great quantities of it to be utilized in Virginia.

The weather has become favorable for the working of the sand beds between Seaville and Millville, New Jersey, and the work is being pushed far ahead of the railroad facilities.

Superintendent William Noel has announced that the Pennsylvania Glass Sand Co., at Hancock, has granted an increase of 10 per cent in wages to its employes. Some of the hands are earning $6 and $7 a day.

The Zenith Sand Co., of Charleston, W. Va., has just filled an order from the Government for 50 carloads screened sand, recovered by suction dredge and screened through $\frac{1}{4}$" opening. This order has been followed by another for the same amount.

The Silica Sand Co., of York, Pa., will resume operations at its quarry this month. The concern is headed by A. J. Hershey, Esq., of Spring Grove. A siding will be built from the Pennsylvania railroad to the quarry to facilitate the loading.

The American Sand and Gravel Co., of Chicago, has conveyed to Max Tauber & Sons, sales stables, a tract of three-quarters of an acre at Crawford and Fullerton-aves, for $30,000 cash. This corner had been used as a yard by the American company for several years.

The plant of the Absecon Sand Co., Absecon, N. J., has been closed down for a week because the 40 employees demand an increase of 10 cents an hour. The laborers are paid 25 cents and firemen five cents additional. The company furnishes sand to the Government for concrete making.

The Rosenberg Sand & Gravel Co., a recent incorporation of Texas, reports a lively business in washed sand and washed river gravel at their plant at Rosenberg, Tex. B. E. Norvell is the active manager, with offices at Houston, and he with J. R. Winston, H. A. Heyck and W. R. Couch constitute the board of directors. The plant is on the main line of the Southern Pacific and Santa Fe Railway.

The Liberty Sand & Gravel Co. has been incorporated at New Orleans with a capital of $15,000 to develop 100 acres of gravel land in Washington Parish, Louisiana. The tract is said to contain about 10,000,000 cubic yards of gravel and sand deposits. Construction of the plant itself, for which the machinery and other equipment has already been purchased, will start in this month. The officers are Jos. Kruebbe, president; J. D. Burnett, vice president and general manager and Ernest Dionne, secretary-treasurer.

Installation of new and modern machinery has been progressing at the sand and gravel pit of the Beloit Sand & Gravel Co. at Beloit, Wis., and it was expected to have the plant in operation some time this month. The capacity of the plant when in full operation will be 22 cars a day. The pit, which is situated on the C., M. & St. P. railroad, will make shipments to Chicago and vicinity as well as Wisconsin. The main offices of the company are in Rockford with President Geo. A. Rubin in charge. A Chicago office is maintained at 3642 So. Rockwell street.

Passed By The Screens

Incorporations

O'Brien Stone Co., Bellefontaine, Ohio; $40,000 to $60,000.

Ohio River Sand & Gravel Co., Cincinnati; capital, $50,000; by C. J. McDiarmid.

Peacock Development Co., Mineral Point, Wis.; capital, $10,000; J. W. Hutchison, H. S. Weil, A. F. Bishop, Jr., incorporators; mining, quarrying.

Raritan River Sand Co., New York; deal in gravel and sand; Millville; $25,000; Edwin S. Gleason, New Brunswick; D. E. Corbett, Matawan; George H. Murray, Metuchen.

The New England Potash Co., Hartford; $500,000; incorporators, Alvan W. Hyde, John S. Fitzsimmons and Arthur L. Shipman, all of Hartford.

Soilamies Cement Co., Wilmington, Del.; capital, $100,$$$; manufacture cement; C. L. Rimlinger, M. M. Clancy, F. A. Armstrong, local Wilmington incorporators.

Wm. F. Barclay, Joseph J. Barclay and Wm. Brice, of Bedford, Pa., are organizing the Barclay Ganister Rock Co. Frank E. Colvin is solicitor.

Lake Erie Sand Co., Sandusky, Ohio; $100,000; William Hendrickson, Alfred Hendrickson, Henry Gerhardstein, Louise Starbird, Louis Werner.

Boston Crushed Stone Co., Boston; capital, $10,000; directors, Simon E. Duffin, president; Gertrude Ryan, 3 Kensington Park, Boston, treasurer, and J. J. Grant.

Audubon Clay Products Co., Lemmon, S. D., and Audubon, Ia.; capital, $100,000; H. L. Tramp, Creston, Ia.; Jno. A. Malloy, Creston, Ia.; Dice Lobdell, Lemmon, S. D

Liberty Sand & Clay Co. is being organized at Pittsburgh, Pa., by Edward W. McCarroll, D. Lee McConaughy and E. B. Power. Wallace & Porter, 928 Frick Bldg., Pittsburgh, Pa., are the solicitors.

St. Lawrence River Granite Co., Inc., Carthage, N. Y.; mine and quarry granite, marble, stone, etc.; $25,000; Horace B. Kelly, Clayton, New York; Eugene C. Crooks, Frances J. Crooks, Carthage, N. Y.

The Valley Sand Co., Des Moines, Iowa; capital, $25,000; marketing sand and gravel; president, R. Snoddy; vice-president, James Horrabin; secretary, V. J. Shrader, treasurer, P. L. Sandahl, all of Des Moines.

The Liberty Sand & Gravel Co., New Orleans, La.; capital, $15,000. Officers: President, Jos. Kruebbe; vice-president and general manager, J. D. Burnett; secretary-treasurer, Ernest Dionne.

Seminole Phosphate Mining Co., Groom, Fla.; capital, $60,000; officers, W. F. Walker, president-director, Groom, Fla.; A. P. Petway, vice president-director, Eastman, Ga.; E. N. Morrow, secretary-treasurer-director, Groom, Fla.; prospectors, miners, manufacturers and dealers at wholesale and retail in the products of all mines and factories, etc.

Little Falls Black Granite Co., Little Falls, Minn.; to quarry, finish and market stone for monumental and building purposes; operate a stone crushing device; capital stock, $75,000; incorporators, John Sparry, president; John Vertin, director; Jacob Kiewel, director; Geo. Kiewel, vice president; Joseph Kiewel, director; Frank Kiewel, secretary-treasurer, all of Little Falls.

Kings and Queens Supply Corporation, Brooklyn, N. Y.; to deal in construction material and to manufacture or produce any and every kind of brick, stone, lumber, cement and building materials; capital, $25,000. Directors: Minton Cronkhite, Greenwich, Conn.; Axel Carlson, 139 West 98th St., New York; Robert G. Wensley, 275 Jefferson Ave., Brooklyn, N. Y.

Cayuga Operating Co., Inc., Portland Point, Tompkins County, New York; to manufacture Portland cement and other cements, lime, brick and all concrete products; to quarry and manufacture limestone; capital, $50,000. Directors: Walter B. Hall, 438 57th St., Brooklyn, N. Y.; Henry Audley, White Plains, N. Y.; J. B. Breckenridge, Richard E. Dwight, 96 Broadway, New York; Thomas A. O'Callaghan, White Plains, N. Y.; Ralph S. Harris, 96 Broadway, and Arthur W. Mattson, 65 Park Ave., New York.

Cement

Crescent Cement Co., Toronto, has been registered.

The Cadmell Brick Co., Ltd., a sand-lime concern, is establishing a plant at Windsor, Canada.

The Edison Cement Co., of New Village, Pa., has just increased the pay of all men working by the hour or day.

The Cayuga Cement Plant at Portland Point, N. Y., has resumed operations after being shut down nearly all winter. The plant employs 150 men.

The Alpha Portland Cement Co., of Allentown, Pa., has just made the sixth increase in the wages of their employes since January 1, 1916.

The Idaho Portland Cement Co., of Pocatello, Idaho, recently incorporated, have postponed construction of their plant until after the war is over, according to a letter to Rock Products from Wm. N. McCarty, of the company.

In connection with the Daylight Saving Plan it is interesting to note that this plan has been in successful operation for a period of thirty-seven years at the plant of the Louisville Cement Co., at Speeds, Ind. David Cook, superintendent, turned the clock back in 1881, and the plant has been running an hour earlier than other Southern Indiana industries since that time. At the time of the change some kicking was heard, but it was soon forgotten.

Retail Dealers

Philip Jordan, a former sand and gravel dealer of Louisville, recently died at St. Anthony's Hospital.

W. H. Pipkorn Co., Milwaukee, Wis.; wholesale and retail building materials; increase of stock from $150,000 to $200,000.

Klug & Smith Co., a Wisconsin wholesale and retail building concern, have increased their capital from $25,000 to $100,000.

W. J. Durham Lumber Co., Wautoma, Wis.. This company handles cement and building material. Change of location from Wautoma, Wis., to Neenah, Wis.

South Byron Produce Co., South Byron, Fond du Lac County, Wis.; capital, $3,000; Chas. A. Bloohm, F. H. Holland, S. H. Bird. This company will also deal in cement.

The McCormick Lumber & Supply Co. was recently incorporated at Cynthianna, Ky., with a capital of $28,000. The incorporators are S. Fred McCormick, Leslie McCormick and Ollie McCormick.

North River Sand Co., Inc., Manhattan, N. Y.; to deal in sand, gravel, bricks and building material. Directors: John Belsole, Caroline S. Belsole, 417 East 22nd St.; Dan'l G. Cosgrove, 142 West 109th St., New York.

Polish-American Building Co., Inc., Buffalo, N. Y.; to deal in sand, gravel, cement, cement blocks, plaster, lime; capital, $10,000. Directors: Stanley W. Kuflak, 634 Amherst St.; Frank J. Bieksza, 89 Broadway, Buffalo, N. Y.; W. Eugene Crosby, 45 Clifton St., Rochester, N. Y.

The Union Cement & Lime Co., of Louisville, has decided to discontinue business and as soon as the affairs of the company can be wound up will be dissolved. This company has been in business in Louisville for fifty years, and the officers stated that the reason for the liquidation is the desire of the older members of the firm to retire from active life. John L. Wheat, president of the company, has been a director of the company since its organization and is the only survivor of the original stockholders. Allen R. Carter is vice president and W. J. Steinhauser secretary and treasurer. The company is capitalized at $50,000 and, according to the officers, is in excellent financial condition.

Quarries

A number of the slate quarries located at Cardiff, Pa., which have been closed down practically all winter, are preparing to resume operations.

The Bound Brook Crushed Stone Co., Bound Brook, N. J., will not operate its stone crushing works at Vernoy for the next few months owing to the scarcity of labor.

Strickler & Hinkle, brick manufacturers of Maytown, Pa., will operate the Hiestand quarry, near Marietta, and take out stone and lime. This was formerly operated by J. C. Dupler.

The Grafton Quarry Co., of Alton, Ill., have not operated their crushers at the Grafton quarries for three years and do not expect to do so this year. When labor is more abundant than at present they will resume, writes J. S. Roper, the secretary.

The Cook Stone Co., of Hopkinsville, Ky., recently incorporated, has taken over the Dalton quarry, which was formerly operated by the Kentucky Crushed Stone Co. The company is planning to install modern machinery, including electric drills, two thirty-to forty-ton locomotives, and a steam shovel.

The Cardiff Green Marble Co. (Pa.) has about completed a new equipment for the crushing of stone and expects to be able to turn out 3,000 tons daily. The U. S. Government and M. & P. R. R. take all of the output. The company is under the management of A. R. T. Lackie.

The American Rubbing Stone Co., operating a quarry north of New Albany, Ind., has made a contract with the Floyd County Commissioners to supply crushed stone, a by-product, at 75 cents per cu. yd. at quarry. Three cars a day can be taken from the seven-foot ledge that is being worked out. John Weller, a director of the American Rubbing Stone Co., recently died at his home in Louisville, following a long illness.

Secretary Samuel Aperius, of the Kentucky Lithographic Stone Co., at Brandenburg, Ky., resigned recently to take a position with the Standard Oil Co. Since then, President R. T. Durrett having joined the Engineering Corps of the Army, the company has decided to stop producing lithographic stone during the war and to confine operations to crushed rock, furnace flux, pulverized agricultural stone, grit and by-products. A spur track is now under construction into the plant. Such operations can go ahead without the need of Mr. Durrett's presence, but manufacturing lithographic stone is an intricate undertaking. During the remainder of the war the quarry will run as usual, and any lithographic stone mined will be held in the rough for finishing later on.

New Construction

The New England Potash Co., of Hartford, Conn., which has taken over the holdings of the International Feldspar Co., at Maromas, R. F. D. 3, Middletown, Conn., will erect a 10-unit plant for the manufacture of potash, Portland cement and super-phosphate from feldspar.

Seven concrete tanks made of sand and gravel aggregate for storing chemicals constitute the unique feature of the large new plant of the Philadelphia Quartz Co. at West Berkeley, Cal. The plant, which was completed this year, covers about five square blocks. The company are specialists in the manufacture of silicate of soda in various forms, for the storage of which the usual method is to construct tanks of steel. When it was decided to use concrete instead of steel, the question of a suitable aggregate arose. Maximum density and resistance to chemical action in the tank concrete was the result desired. After a series of tests, the sand and gravel from the California Building Material Co.'s pits was selected as meeting the exacting specifications. The California Building Material Co., with offices in San Francisco, also furnished the sand and gravel for the whole plant, which is said to be the most complete in the country.

Construction Activities in the Nation

KANSAS BUILDING BOOMS

Topeka, Kan.—The report issued by the State Superintendent of Public Instruction shows that war has failed to retard the construction of school houses the past year, for over $3,000,000 were invested in such institutions in 1917. The state came near breaking all records, and many cities have voted bonds for additional facilities and others have called bond elections. The oil districts of the southern part have taken the lead in construction and the ever increasing development bids fair to outdo all past records.

Wichita—Wichita broke all records in building the past year, and 1918 bids fair to equal if not exceed the figures. In 1916 the total was $1,993,000, and the past year over $5,000,000. A large factor in the increase is due to oil interests in near-by counties. Along with the construction of large office buildings and mercantile houses many new homes have been built, the total being nearly 900.

Hutchinson—The building total for Hutchinson for 1917 is $1,865,395.00.

Salina—The total building permits issued for 1917 were slightly over the million mark and is better by over $200,000 than the best previous year. Much has been planned for the coming year and can only be held back by a crop failure.

DECREASE IN SCRANTON

Scranton, Pa.—Building operations fell off greatly during 1917, as compared with 1916. In 1917 there were only 391 permits issued for a total improvement valuation of $1,388,871, as against 645 permits for a valuation of $1,536,644 in the preceding year. Two hundred and fifty-four fewer permits were taken out and the difference in valuation was $147,773.

The poorest month of the year just ended was December. Only seven permits were granted and they were for buildings of a valuation of $5,030.

ERIE 1917 RECORD

Erie, Pa.—Increase in new construction in Erie for 1917 was $1,098,003, according to the report given out by secretary of the public safety department. Permits issued for the year were 113 less than the previous twelve months.

Total operations for 1917 amounted to $3,889,195, with 1,442 permits. In 1916, 1,535 permits issued for operations amounting to $2,800,192.

December, 1917, shows an increase over the same period in 1916. Fifty-seven permits were issued, with construction work amounting to $180,094. In the same month in 1916 there were fifty-nine permits issued with a record of $173.75.

Big Building Operations in Detroit

DETROIT, Mich—Concentration of industrial activity toward aiding the vigorous prosecution of the war is the dominant factor in Detroit's economic situation. War orders now held here are definitely established at a valution of $750,000,000. There is, however, one big obstacle that is being combatted; the shortage of labor now penetrates the ranks of the unskilled. New factories and factory units which have been tooling up are now calling for men of little or no experience to perform work of a standardized nature.

Building trades are looking forward to better times in the near future. This is the season for out-of-door construction work and three new skyscrapers are to be under way within a short time.

The month of March was featured by a large number of announcements concerning the advent of new and additional manufacturing facilities. Several new plants were placed in course of construction during the month.

KANSAS CITY EXPECTS BIG YEAR

Kansas City, Mo.—A resume of the building activities of Kansas City, Mo., the past year is anything but discouraging and the prospects are even better than would be expected under existing conditions. While it is true that the war, high prices of material and slow shipments have retarded, yet the total for the year is but a scant million less than that of 1916. The total value of buildings erected for 1917 is $10,030,000, and that of 1916 at $11,000,000.

The most notable decrease is in the erection of homes and apartments, while the construction of factories and warehouses has increased. Residence permits are off about 300.

Apartment house owners report "full up," which means that building in this line will have to be resumed the coming year to take care of the natural increase of the city.

CANADIAN 1917 RECORDS

Toronto, Can.—The total value of building permits issued here during 1917 was $7,250,000. In 1916 the permits totaled $9,881,671, which included the new Union station costing $3,000,000. Normal building showed a substantial increase last year.

Montreal—Montreal's building permits for 1917 amounted to $4,387,638. Of this $3,252,757 was for new buildings and $1,134,881 for repairs.

Winnipeg—In Winnipeg there were 1,263 buildings erected in 1917 at a cost of $2,206,500.

ALLENTOWN BUILDING RECORD

Allentown, Pa.—There was a decrease in building operations of more than 50 per cent in number of buildings and 40 per cent in value of investment last year.

In 1916 there were erected 756 buildings at a cost of $2,178,585, while the record for 1917 is 372 buildings at a cost of $1,367,907, a loss of $810,678. Of the 372 buildings 159 were of one story, 194 two story, fourteen three story and six four story.

INCREASE IN OMAHA FOR 1917

Omaha, Neb.—Building operations during 1917 showed an increase of 7 per cent over 1916. The totals: 1917, $7,737,047; 1916, $7,226,107.

CLASSIFIED ADVERTISING

ADVERTISEMENTS in this department are for Positions Wanted, Positions Vacant, Business Opportunities, Plants for Sale, etc.

RATES: 25c per line, per insertion; minimum charge, 50c. With display of any sort, $2.50 per column inch, per insertion.

Positions Vacant

WANTED: Salesman soliciting builders' supply dealers to sell Mortar Colors and Builders' Specialties. Liberal commission. Territory reserved. Address Box 1253, care ROCK PRODUCTS.

WANTED: Competent man to take charge of stone quarry producing crushed stone for railroad ballast, highway purposes and concrete work. State age and experience, also salary required, as well as where last employed. Address Box 1254, care ROCK PRODUCTS.

WANTED: Good man for engine repair and boiler work in general. Plants at nine points in Ohio, Indiana and Michigan. Would want employee to reside in Greenville. Address the Greenville Gravel Co., Greenville, Ohio.

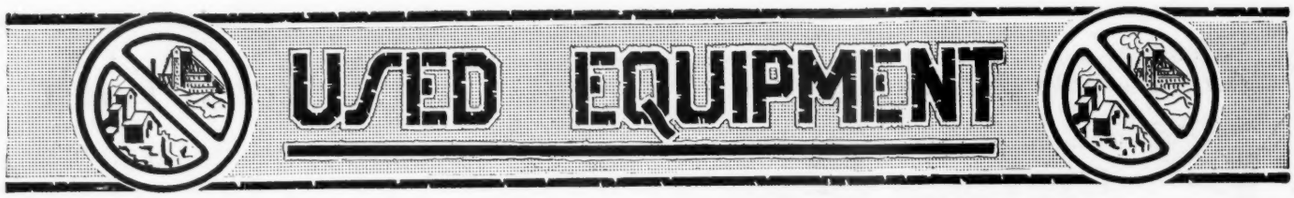
For Sale

FOR SALE: 1½-yard dragline outfit complete. Can ship at once. Price right. For details address J. A. Hambleton, Malta, O.

Plants for Sale

FOR SALE OR LEASE: Crushed stone quarry situated near Wilkes-Barre, Pa. Very hard green sandstone, practically equal to trap rock for road material. Quarry equipped to produce five to six hundred tons per day—has frequently run eight hundred. Ample rail facilities and an extensive market. For detailed information communicate with Arthur L. Stull, 182 S. Franklin St., Wilkes-Barre, Pa.

FOR SALE: Sand and stone quarry, fully equipped. Proposition includes about 400 acres of land, 15 miles from Pottsville. Includes large engine, 2 boilers, small and large stone crushers and about 2000 ft. of railroad siding to the sand hills, connected with the P. & R. Ry. ready to start work inside of 24 hrs. Low rates can be obtained from the carriers. If not sold by May 15th, plant will be dismantled to highest bidder, including all machinery such as 125 H.P. Allison engine, 2 boilers with equal capacity, recently replenished with new tubes, large and small stone crusher, blacksmith and repair house, sand and stone screens, all kinds of tools. Excellent market in Schuylkill Co. For further information address Joseph H. Garside, 100 S. Center St., Pottsville, Pa. Advanced age of owner reason for selling. Address P. O. Box No. 265, Pottsville, Pa.



ADVERTISEMENTS in this department are for the Sale and Want of Second-Hand Machinery and Equipment. **RATES:** $2.50 per column inch per insertion.

FOR SALE

One No. 2 Clipper

machine, gasoline, non-tractor outfit for blast hole drilling 5-inch tools and belt-driven Ford blower.

The Rocky Ridge Lime and Stone Co.
252 Ohio Building TOLEDO, OHIO

TRAILERS

Four—Troy 2½ ton reversible bottom dump TRAILERS—bought new in Summer of 1916; perfect condition; practically as good as new in all respects. Troy Model No. 212. Immediate delivery.

Reasonable price.

E. C. SHERWOOD,
50 Church Street, NEW YORK

RAILS

All sections of new and second-hand, on hand for quick shipment. Also purchase old and abandoned plants for dismantling purposes.

M. K. FRANK, Pittsburgh, Pa.

IMMEDIATE DELIVERY

2—No. 6 McCully Gyratory **Crushers** equipped with manganese steel head and concaves and heavy duty shaft, standard discharge, 12 x 44 in. feed openings, 34 x 16 driving pulley, weight 48,000 lb. each, complete. Capacity 50 tons, 2-in. stone an hour; 120 tons 4½-in. stone an hour. Bought in 1916; used only one month; excellent condition.

1—Patnoe Steel Chain **Elevator** complete on wood frame with geared head and driving pulley, 35-ft. centers, 53 elevator buckets, 42-in. x 19. Bought in 1916.

1—No. 8 Geared Head **Elevator** complete on wood frame with 32-in. 8-ply belt, 69-ft. centers, 105 elevator buckets, 30 in. x 17. Bought in 1916.

1—Thomas 3-Drum **Electric Hoist** equipped with latest improved boom swinging attachment with 150-hp. AC Wagner motor, 514 rpm.

1—10 x 12 Chicago Pneumatic Tool Co. **Air Compressor,** Style GC-SC, 11 x 18 x 16½, Belt Drive, with horizontal Air Receiver 4½ x 11½. 500 cu. ft. per min.

OSCAR DANIELS CO., First National Bank Bldg., Chicago

For Sale:

1—No. 6K Gates Rock Crusher.
1—No. 3B Gates Rock Crusher.
1—3¼ Ingersoll Air Drill.
1—Temple-Ingersoll Electric Air Drill.
1—Allis-Chalmers 36″x36″ friction hoist with 450′ ¾″ steel cable.
1—Lidgerwood 24″x24″ friction hoist.
All in excellent condition.

Rice Stone Co.
Grand Ave. and Rockwell St.
CHICAGO

CRUSHER EQUIPMENT

Prices Cut to Close Out Quickly

No. 8K Allis-Chalmers Crusher, Shop No. 6760. Tip-top condition. Left hand angle drive. Extra Eccentric and Concaves.

15 Quarry Cars, 2 yard, All Steel, End Dump, 36″ Gauge. Built for hard work. You can't wreck them.

48″x20′ Allis-Chalmers ALL METAL Revolving Screen with 6′ Dust Jacket. Screen Sections to suit purchaser.

Two Belt Driven Friction Hoists, nearly new; fine condition. Will handle 4 yard cars on 30 per cent incline.

20″x30″ Buckeye, Double Valve Automatic Steam Engine. Runs like a watch. Make your own price.

Send for complete list.

LEHIGH STONE CO. KANKAKEE, ILL.

We are always in the market for

Rails—8 lb. to 40 lb.

Pipe—½ inch to 10 inches

Boiler Tubes—2 to 4 inches

Steel Tanks—all sizes

What have you to offer?

KEYSTONE PIPE & SUPPLY CO.
Butler, Pa.

IMMEDIATE SHIPMENT

1—Motor-driven Rock Crushing plant (complete).
2—1500 cu. ft. steam driven air compressors.
20—Crushers, sizes No. 2 to No. 12.
1—Piece ½″ Roebling steel cable, 580′. Traction Brand, 10c foot.
4—Pieces ⅝″ Roebling steel cable, 285′ each. Traction Brand, 11c foot.

POWER PLANT EQUIPMENT. SEND US YOUR INQUIRIES.

Ross Power Equipment Co.
INDIANAPOLIS, INDIANA

FOR SALE

Thew

Steam Shovel

No. 0—⅝-yd. bucket, traction wheels. In absolutely first-class condition. Address

R. J. NOONEY
P. O. Box 210, E. Akron, Ohio

For Sale

Three V-shape side dump steel cars (never used), roller bearing axles, 30-in gauge.

Price $75 each, f. o. b. cars, Attica, New York

J. E. CARROLL SAND COMPANY
907 White Building Buffalo, N. Y.

For Sale—One Kritzer 6-Cylinder Hydrating Machine complete, with Raymond System of separation. Immediate shipment. Used only a short time—practically new. Not now manufacturing hydrate. For particulars, address

BASIC PRODUCTS COMPANY
KENOVA WEST VIRGINIA

Second Hand Grinding Machinery For Sale

On account of changes, several 42-in. Fuller Mills all in good condition are for sale.

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A-30-18, Care This Paper

It gets immediate attention if you mention ROCK PRODUCTS.

The advertiser wants to know that you saw his ad in ROCK PRODUCTS.

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Haiss, Geo., Mfg. Co., Inc.

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Atlas Car & Mfg. Co.
Butterworth & Lowe

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Atlas Port. Cement Co.
Carolina Portland Cement Co.
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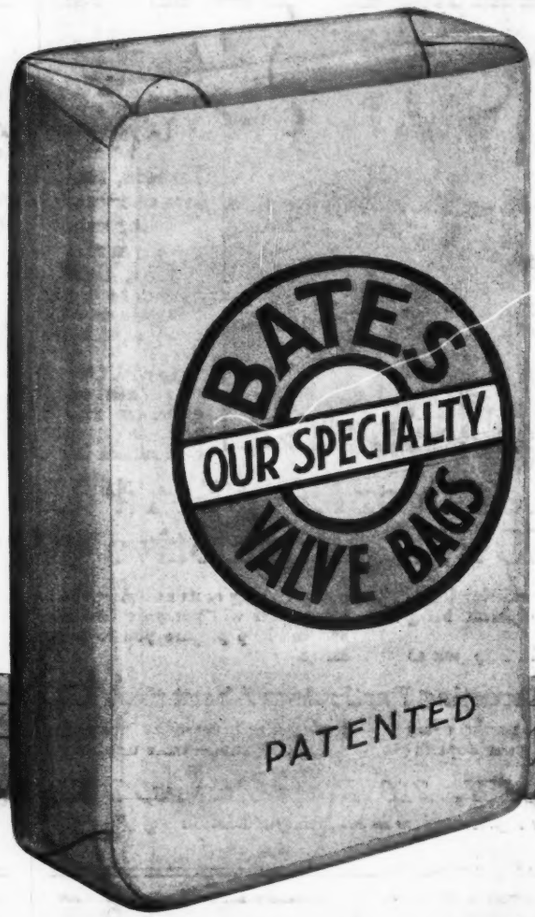

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The Bates Valve Bag is the ideal container for agricultural lime. Neat, Clean, Inexpensive.

BEST QUALITY PAPER BAGS

Because of the uniformity in shape the bags can be piled long and high. Claims for short weight an impossibility.

Ninety per cent of the hydrate manufacturers in the United States and Canada use them. For bagging lime, cement, plaster and similar materials it is without a rival.

URSCHEL BATES VALVE BAG CO.

TOLEDO, OHIO.